

Flight, October 21, 1911.

# FLIGHT

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MR. CLAUDE GRAHAME-WHITE IN AMERICA.—At the moment of starting on his 70-h.p. Nieuport monoplane at Boston, U.S.A. From a photograph supplied by Miss Grahame-White.

# EDITORIAL COMMENT.

## The Aeroplane in War.

In last week's issue of FLIGHT we published an interesting letter from "R.A. (Retired)," which to some extent traversed the conclusions at which we arrived in our editorial article of the 7th inst., dealing with the Aeroplane in War. The subject is a very wide one, and one that can scarcely be dealt authoritatively with by the layman. Indeed, we do not know that anyone is in a position to speak with authority on the precise rôle of the aeroplane or the dirigible in war, for even in their present relative perfection they are but the arrivals of yesterday, and their application to the purposes of an army in the field is practically still in a state of crude experimentalism. That is to say, the military aeroplane and its work is still a matter for much speculation with exceedingly little practical data to guide us, so that the layman's conclusions are as likely to be reasonably near the mark as those of the trained soldier and strategist. That is why we, in our original article, ventured to lay down certain mild theories of our own.

Agreeing with our dictum that the first duty of the aeroplane in war will be the gaining of intelligence, our correspondent reminds us that in the fog of war, intelligence worth having generally has to be fought for, the inference apparently being that the scouting aeroplane will have to undertake a sort of detached action of its own before it will be able to gain intelligence worth having. The rule is quite near enough to the facts of the case to be accepted as true, under the conditions with which we are familiar. But the introduction of the aeroplane as part of the equipment of the modern army brings a new and unknown factor into the case, and the strong probability is that in future wars much information will be gained by an efficient aerial scout corps without any fighting at all. We have got so used to talking of "aerial fleets" that we are apt at all times to use the analogy of the marine service in thinking of or discussing aerial strategy and tactics. This is, doubtless, a perfectly correct analogy to draw, but there seems to be one point of confusion which has arisen and by which our correspondent has allowed himself to be influenced. That is, to regard the military aeroplane as the destroyer of the air, whereas so far as it is possible to determine with the data at present to hand, its functions in relation to the army in the field will be much more analogous to those of the cruiser to the battle-fleet. That is, its primary business will be that of gathering intelligence, avoiding action if at all possible until that intelligence has been gained. Visions of aerial navies grappling to death in the "blue Empyrean"—we believe that is the correct description to use—are all very well in the pages of H. G. Wells' novels, but we cannot see that there is much justification for the dreaming of such dreams at present. Undoubtedly, the aeroplane will be forced to action under certain circumstances, as for example in the case where a general officer commanding may send out his aerial scouts to gather vital intelligence and order them to push home their reconnaissance at all costs. Their functions immediately become those of the searching cruiser squadron intent upon getting into touch with the enemy's fleet, maintaining at the same time communication with their own ships. In this case the function of the enemy's cruisers is to drive off the searching vessels and prevent them gaining the intelligence it is their mission to obtain. Generally, unless the one squadron is in much greater strength than the other,

this will mean a very pretty action or series of actions, but it must be kept in mind that these actions are taking place merely as incidentals to the main object of cruiser tactics. So it must be in the case of the aeroplane reconnaissance. Its first rule of tactics must be to avoid and not to seek action, until it has fulfilled its first mission. After that has been finished with, the functions of the aeroplanes of an army may be anything or nothing. As it is conceivable that under certain circumstances of war an admiral may use all his fast craft, including his cruisers to perform the functions more usually associated with the torpedo boat and the destroyer, aerial corps may be employed on destructive missions in the same way, but not until they have carried out their first duty and can be of no more use to the general commanding in that direction.

Our correspondent appears to take the view that we in some way were arguing against the arming of the aeroplane. That is not so. What we cannot see is the aeroplane as a bomb-dropping device. True, it may be used on occasion for such hazardous work, from which it is practically certain there will be no return, but as we have insisted that is not likely to be its first or most important duty in war. Undoubtedly the armed aeroplane must come, and as our correspondent says, a constructor who could instal a maxim gun effectively in an air-craft would be doing good service. Or rather—for we do not see a great deal of constructional difficulty in fitting a maxim mounting in almost any of the best types of aeroplane—if someone will show us how to make a steady gun-platform of an aeroplane manœuvring in gusty weather, he can rely upon receiving the thanks of the French War Department—our own would probably wave it aside as something not worth bothering about.

## Raising the Qualification Standard.

The action of the Royal Aero Club in determining to issue two separate forms of certificate to aviators is most commendable. The certificates may be described as elementary and advanced, inasmuch as the qualifications necessary to obtain the first will probably remain much as they are at present while those demanded for the second will be of a much higher standard. In deciding to retain for the present the examination for what we have called the elementary certificate, the Club has, we think, shown a wise discretion, for much as we have advanced during recent months it is still essential that the embryo aviator should not be discouraged by making preliminary examinations and tests too stiff at the outset. But the fact that the ruling body has officially recognised the fact that something more is necessary to make the efficient airman than the relatively easy test which it imposes on the would-be pilot—for that is what it amounts to—is an earnest of what must come in the very near future. Compared with the machine of the date at which the original tests were devised, in many respects the aeroplane of to-day is a greatly advanced instrument of flight and as it improves and becomes capable of evolutions, under the growing skill of pilots begotten of experience of others, which were impossible even a few months ago, it is but right and proper that a higher standard of qualification should be demanded of those over whom the Club exercises its control. In a word, the Club's tests must be progressive in direct relation to increasing knowledge of air navigation, the improvement of the machine and its facility of control.



Some Brookland's pilots who have distinguished themselves in the arena of aviation during the present year.



## CLAUDE GRAHAME-WHITE IN THE UNITED STATES.

To Miss B. Grahame-White, the famous aviator's sister, who has just returned from America, where she has accompanied her brother on his tour, we are indebted for the following interesting information:—

On their arrival in New York, the first four days were spent in the company of Commodore Benedict, who had invited them to join a cruising expedition on his 400-ton steam yacht. Unfortunately this pleasant interlude had to be cut short owing to the urgency of being present at the commencement of the Boston meet at Squantum, whither his 70-h.p. two-seater Nieuport had been shipped direct from France.

The weather during the week was so utterly impossible—there was no flying whatever for the first four days—that an extension of a

new controls, and, perhaps, to the fact that in the same competition in the previous year no preliminary circuit of the aerodrome was conditioned, Grahame-White set straight off for the Light and completed two laps, each of 33 miles. He was accompanied by his engineer, Reginald Carr.

On his return to the Squantum field, he found the alighting ground impeded by the presence of two biplanes, and to indicate the necessity of their removal he continued to circle the aerodrome, signalling the while. No one seemed to understand his signals, and he was obliged to land on unsuitable marshy ground, into which the machine promptly buried its nose, with disastrous results to the latter. In addition to this mishap, he had the misfortune of learning that, although he had made fastest time over the course, he had been disqualified for not making a preliminary circuit. Somewhat reminiscent of the Statue of Liberty trouble!

At the Boston meeting the trick "stunts" were performed by Beachey and Ely, Grahame-White leaving these items severely alone. As he wisely remarks, "It's better to be a live man than a dead hero." It is a good sign to see that the Americans are losing their desire for sensational flying, and are becoming more appreciative of that steady kind of flying work which really does further the science, for at the Nassau Boulevard meet at New York such dangerous flying was definitely forbidden.

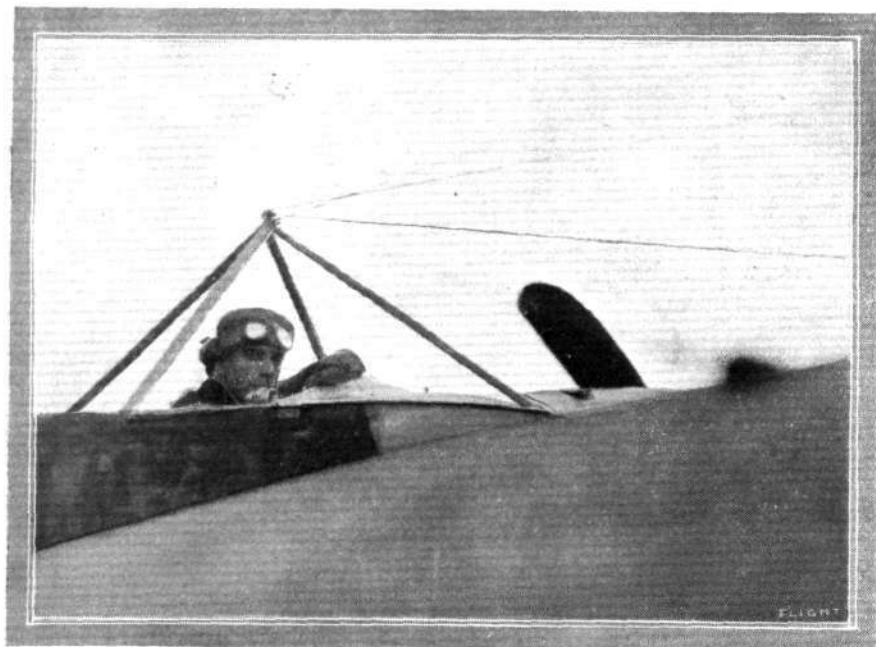
During the meet he cabled Nieuport for speedier wings, and the latter replied in what was probably the last cablegram he ever sent, declining to make them, as their use would probably introduce some danger. Within 24 hours poor Nieuport met with his fatal accident.

Up to the present time Grahame-White has not made a feature of passenger flights, and the only flights he has yet given were to his personal friends, Mr. James Blake and Baron von Hochwaechter, and also to his engineer, Carr. As a matter of fact, the latter nearly always accompanies him, as Grahame-White finds the machine considerably steadier with two up.

The "Baby" had arrived in time for the Nassau Boulevard meeting, and it proved slightly faster than the Wrights'. This miniature biplane's quickness and latitude of control was as much admired as the Nieuport's blunt-nosed spark-like appearance and enormous speed.

Grahame-White had the misfortune to incur a second mishap while starting away to visit the scene of Sopwith's accident. The latter, accompanied by a passenger on his Wright biplane, had, while wanting to alight on the beach, misjudged his distance, with the result that he fell into the sea, happily without personal injury. As for Grahame-White, he in getting away from the aerodrome ran foul of another machine, and was obliged to make for a ditch, 10 ft. deep, at such a speed that the resultant impact did little to improve the appearance of the machine.

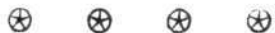
However, he suffered no injury beyond a bruise on the lip, for his sister had that morning sent him a thick pad to fix over the edge of the metal wind screen.



Grahame-White in his 70-h.p. Nieuport, at Boston, U.S.A., waiting to start for the race round the Boston Light.

further seven days was decided upon. For the reason that the arrival of Grahame-White's "Baby" biplane had been delayed by the dock strikes in Liverpool, he was unable to compete in the bomb dropping and alighting events.

However, there was not another machine that could approach his where speed and rate of ascent was concerned, so he had little difficulty in capturing those prizes. His first real flight on the Nieuport was the double trip around the Boston Light, a course for the most part above the waters of Boston Harbour. Before starting he had only made two short trips on the new machine, and so was far from being absolutely *au fait* with the pedal-controlled wing warping and lever-operated elevator and rudder peculiar to the Nieuport control. Probably owing to his minute attention to the



### Aerial Touring in Belgium.

THE Chevalier Jules de Laminne thoroughly believes in putting his Henry Farman machine to practical use, and has been continuing his interesting aerial excursions. We have already referred to several point-to-point trips made by him, and on Sunday, the 8th inst., when the Count and his wife decided to accept an invitation of the Baroness de Gaiffier d'Hestry to lunch at Marchewette Castle, near Namur, he made up his mind to make the journey *en aeroplane*. Mounting his racing Henry Farman machine, and taking as passenger his friend, Lieut. Selliers de Moranville, the Chevalier left his castle grounds at two minutes to ten and arrived at his host's residence at half-past ten, having covered 25 miles in 33 minutes, and beating the motor car by which his family made the journey by about 20 minutes. About a quarter to two the aviators remounted the machine and were back at Oudoumont Castle at ten minutes past two. After landing the Chevalier was asked by Baron de Macar to carry an urgent message to Major Vischers at Rimiere Castle. Taking the Baron with him as passenger, the Chevalier started from his Castle Grounds and soon had his destination in sight. The Rimiere Castle being surrounded by thick

forests no possible landing place could be found, but this predicament had been guarded against, the message having been fixed to a tennis ball to which had been attached a long strip of fabric, and the aviator was able to throw it to the crowd on the Castle Terrace which had assembled on hearing the humming of the Gnome motor. After making a circle above the Castle the two aviators returned home, having covered a distance of 25 miles in 30 mins. 50 secs.

### Aerial Photography.

PHOTOGRAPHERS are ever on the look-out for new fields to conquer, and many have found the taking of pictures from a bird's-eye point of view very fascinating. The number that can obtain these from a balloon or aeroplane is limited, but anyone can secure quite good pictures by means of a kite and a simple arrangement of automatic shutter release fitted to the camera. In the "Photographic Annual" for 1911-12, which is brimful of good things, the opening chapter by Mr. A. G. Field deals with the subject of aerial photography, and a perusal of it should induce many photographers and kite flyers to combine the two pastimes. The price of the book, published by Messrs. George Routledge and Sons, Ltd., is 1s. net.

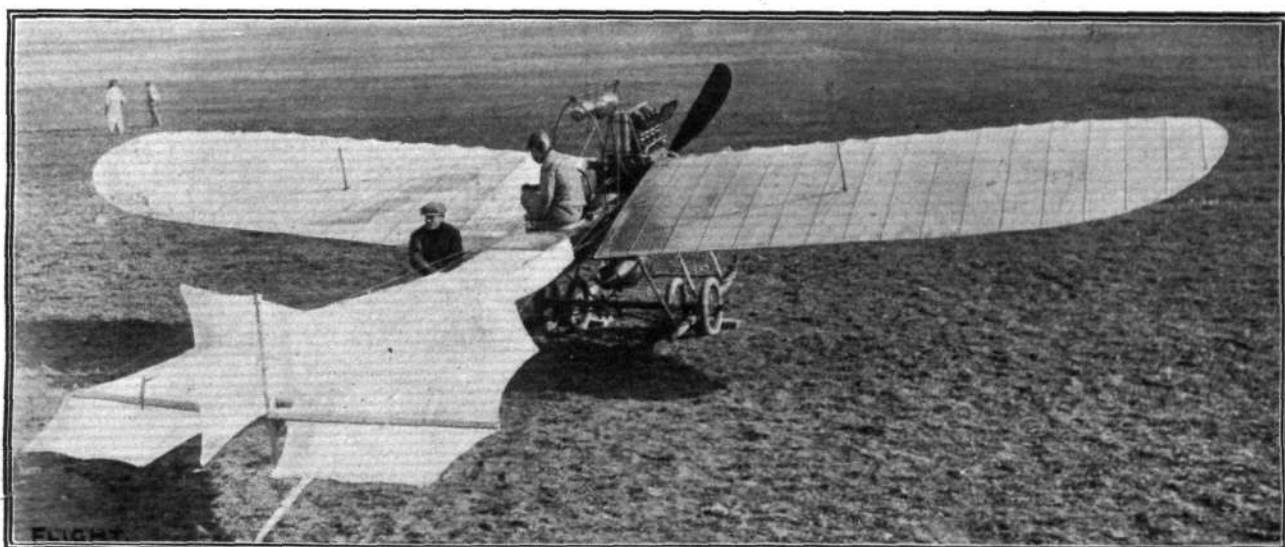
## THE FRENCH MILITARY COMPETITIONS.



A side view of the new passenger-carrying Borel monoplane, furnished with a Gnome motor of 140-h.p. The machine follows broadly the general disposition of the single-seater monoplane of the same maker. The chassis, it will be noticed, is equipped with four wheels, in place of the two on the lighter model, while the skids are more strongly connected with the fuselage. The wings, too, are slightly different, in that their entering and trailing edges taper towards the tips.

CONTINUING the story of the French military trials of aeroplanes from the point at which it had to be broken off in our last issue, Fischer on the Henry Farman, and Barra on the Maurice Farman, successfully carried out landing trials on the morning of the 10th inst. Level, on the Savary biplane, was also out for the first test but had to land at Neufchatel for adjustments. There were also one or two unofficial flights during the day, Vedrines taking a couple of passengers on the Morane, Crombez four and five passengers on the Sommer, while Paulhan in landing from a flight broke one of the radius rods of the chassis of his triplane. The following day was quite a busy one. Although the wind was in a fickle mood, Fischer on a Henry Farman was the first out making the third of his preliminary tests, while Renaux, on a Maurice Farman and Moineau on a Breguet were the only others who were officially tested during the day. In the morning Colliex was out on the Voisin Canard, putting it through some weight-lifting tests, while in the afternoon, the wind having gone down, Ladougue was flying on his Goupy, as also were Weymann and Count Robillard

on their Nieuports, Fischer on the Henry Farman, and Dubreuil on the Hanriot. Weymann flew over to Mourmelon and back on his 100-h.p. Nieuport, and on the return journey is said to have attained a speed of 200 k.p.h. Unfortunately the day was marred by an accident, a mechanic named Garde being struck by the propeller of Count d'Hespel's machine while preparations were being made for the flight. The injuries sustained were so severe that he died in the hospital the following day. The 12th was also a busy day, although a disastrous one, René Level, who has been so successful in piloting a Savary biplane, meeting with an accident and sustaining such serious injuries that he died on Saturday morning. He had been flying with several passengers, and during one flight had to come down owing to a broken water connection. His passenger returned for a spare part, but in the meanwhile Level effected a repair and started to fly back. When within a short distance of Betheny, the machine was observed to be descending rapidly from a height of 150 metres. It collided with some telegraph poles, and then dropped like a stone



THE 100-H.P. CLERGET-ENGINED HANRIOT MONOPLANE AT THE MILITARY TESTS AT RHEIMS.—It will be noticed that changes have been made in the landing-carriage, two pairs of wheels now being employed in place of the single pair hitherto adopted. The situation of the petrol reservoir, as mentioned in our article on aeroplane fires in last week's issue, appears to be extremely unfavourable, for if a bad landing were made—one sufficiently rough to carry away the landing-chassis—it is more than probable that the tank would rupture and a serious fire result.



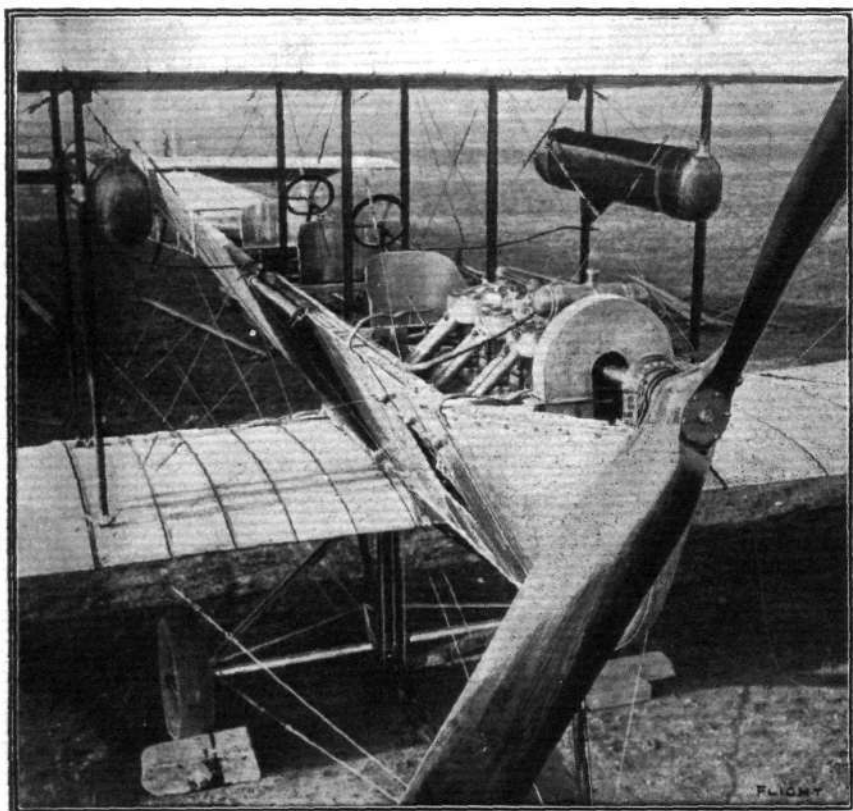


"AERO-TORPEDO NO. 1."—The result of the collaboration of Tatin and Paulhan. The photograph gives a good idea of the type of body design that is at present meeting with much favour in France. The ventilated metal shielding under the front of the wings indicates the position of the motor—a 50-h.p. Gnome—driving a propeller at the rear end of the body by means of a hollow universally-jointed shaft. Accommodation is provided for the pilot in advance of the wings.

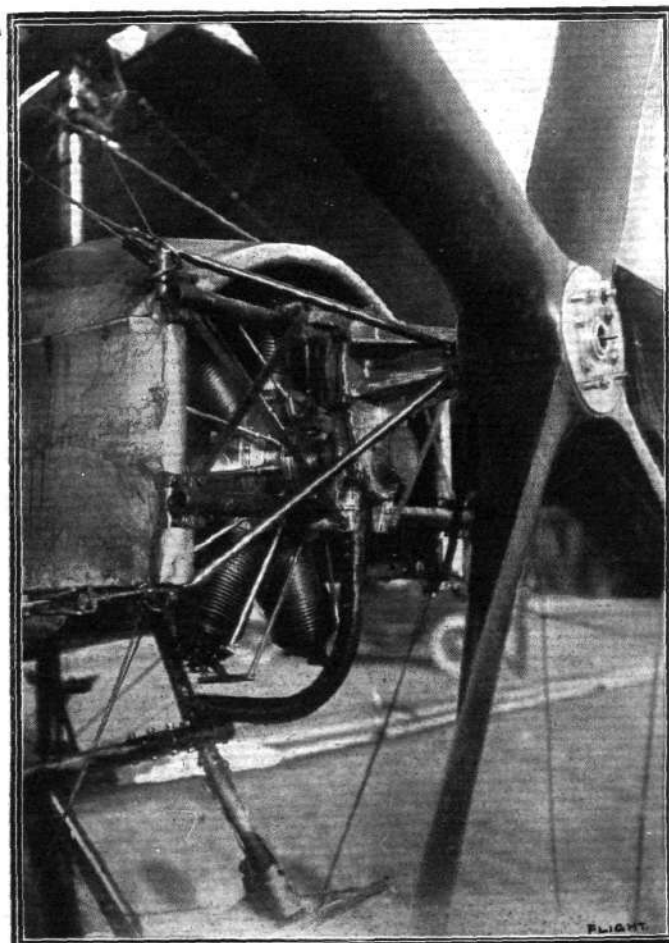
on to the railway line. It was found that the pilot had broken his spinal column in two places and also had injured his skull very severely. He was at once taken to hospital, where it was seen his condition was hopeless. Colliex, on the Voisin Canard, was the first to make an official test, but had to land at Montcornet for adjustments. Weymann on a Nieuport, Gugenheim on a Henry Farman, and Renaux all made successful trials in the morning, while in the afternoon Weymann, Renaux, Barra and Fischer completed the preliminary tests; while others seen in the air were Moineau on the Breguet, Ladougue on the Goupy, and Vasseur on the small Hanriot. Dubreuil on the big Hanriot also made a couple of flights, and Bregi, just back from Morocco, put in a trial spin.

Friday was a blank day as far as flying was concerned, although the competitors took full advantage of the opportunity to look over their machines in the sheds.

The doings on Saturday were somewhat damped by the news of the death of Level, who was very popular. Gugenheim was the first out on a Farman, followed by Moineau on a Breguet, although the latter had to stop when about 6 kiloms. from the Camp, as he could not see his way owing to the mist. In the afternoon Barra went over to Mourmelon and back with a full load on his machine and Bouvier was up on a Goupy biplane. Sommer took up four passengers, including two ladies, whilst Henry Farman, Renaux and Moineau were all putting in some practice. Gaubert also had a short trial on the Astra-Wright, while the Astra biplane was taken for a spin by Labouret with two other passengers and Goffin



This photograph of the new Astra biplane, which is upholding the credit of that firm in the French Military Tests, gives a good idea of the general disposition of this interesting machine. Seating accommodation is provided for three, one of whom has a seat right in front for observation purposes, while the two seated in tandem behind him are each provided with controls. The motor is an 80-h.p. 6-cyl. Chenu, and drives a large diameter tractor-screw through reduction gearing.



One of the results of the French aviation tests has been the increase in popularity of the four-bladed propeller. The above photograph illustrates a four-bladed propeller fitted to a Breguet biplane, and driven by a 100-h.p. Gnome engine through reduction gearing. Use is also made of a similar propeller on a 100-h.p. Nieuport monoplane.



THE "AERO-TORPEDO" AS IT APPEARS FROM THE REAR.—No provision is made for wing-warping, the upturned wing-tips being expected to endow the machine with a sufficient modicum of lateral balance. It has a span of 9 metres, and its overall length is 8.60 metres. Without fuel or pilot it weighs 350 kilograms.

was putting the Astra triplane through its paces. Leblanc had out one of the Blériot's, and after making a circuit at a few feet above the ground it came down on the left wing with dire results.

The prospect of seeing some good flying attracted a crowd estimated at about 30,000 persons to Rheims on Sunday last when the first flight was made by Weymann, while the second was by Moineau. Afterwards Bregi was seen flying one of the Breguets with three persons on board. Others who were in the air were Mahieu, Goffin, on the Astra triplane, Colliex, Bouvier and Dubreuil. An accident, which might have had serious consequences, occurred to Gugenheim. While taking a preliminary run across the ground one of the wheels of the chassis came adrift, and before the machine could be pulled up serious damage had been done, but fortunately the aviators were unhurt. During the day the Military Commission met and decided upon one or two alterations to the rules in accordance with the protests made by the manufacturers. It was also decided that the contest for the final classification should take place on November 4th, over a course from Rheims to Amiens and back.

On Monday morning no flying was possible during the early part of the day owing to the mist, but interest was aroused by the publication of the official results to date. These showed that the three landing tests, in stubble, long grass, and on ploughed land had been successfully accomplished by Barra and Renaux on Maurice Farmans, Weymann on a Nieuport, Moineau on a Breguet, and

Fischer on a Henry Farman, while Gugenheim had made two out of the three necessary tests. In the afternoon Barra and Renaux and Weymann made their speed tests over a route to Rheims and Mourmelon and back, the times for the 60 kiloms. being, Barra, 46 mins. (speed 79.8 k.p.h.); Renaux, 1h. 3m. 54s. (speed 69 k.p.h.); Weymann, 33 mins. 2 secs. (speed 108.9 k.p.h.). Colliex made one of the landing tests, and among other flights seen during the afternoon were those by Molla, who carried four passengers for a flight on a Sommer machine, Bregi, Dubreuil, Sommer, Bathiat, and Bouvier, while Gaudart took the Paulhan "Torille" for a spin.

On Tuesday morning there was very little flying, all work being done in the hangars, but several tests were made in the afternoon. Collier, on the Voisin, made his first official landing test, and Moineau passed the speed trial satisfactorily. Weymann also made two tests for altitude, in the first climbing to 530 metres in 12 mins., and in the second getting up 500 metres in 11 mins. Barra, late in the evening, went up to 500 metres in 17 mins., but this was not an official trial. Among the other flights seen, Espana, on a Nieuport, went to Mourmelon and back, Lieut. Vence started away for Douai, Franck had the Savary out, while Bouvier and Labouret also put in some practice.

During the morning the manufacturers had a meeting to protest against the course for the final classing, and it was decided that Rheims to Chalons and back should be substituted for the proposed Rheims-Amiens course.

## SCHOOL AERO CLUB NOTES.

By ROBERT P. GRIMMER, General Secretary, British Federation of School Aero Clubs.

A CORRESPONDENT, whose name for obvious reasons I am unable to give here, has recently written to me a somewhat forcible letter in criticism of my views towards models and model making. He says:—

"I have observed that you repeatedly claim that the science of aviation will be distinctly benefited by experiments with models, and—to quote your own words—that 'the humblest schoolboy may discover some radical improvement.' Now, it seems to me that full-sized machines in no way resemble models, they are constructed on very different principles, and that whatever merit model-flying may deserve as a sport, any attempt to apply the principles of the model to the full-sized machine must inevitably end in disappointment and disaster."

These extraordinary views are held by very many people, and I should be neglecting my duty to the Federation if I did not point out the fallacy. I will grant that at the present time there is a great dissimilarity between the model and the full-sized machine, but that is simply because the full-sized machine is years behind the model in point of development, both as regards stability and efficiency.

It is an absolute fact that the full-sized machine is gradually approaching the model as regards design. The best models are and always have been of the tail-first and propeller-behind type, a principle that has been held up to ridicule again and again by aeronautical engineers. Yet, to what class belong the Valkyrie and Voisin Canard, two successful machines of the present day? If the scale drawings of the latter be examined, it will be found closely to approxi-

mate in general proportion to the Bragg-Smith biplane, which was awarded first prize at Wembley Park as far back as 1909.

I make the distinct and definite assertion that if our British firms had made careful and scientific experiments with models on the lines adopted by some of their Continental confrères, the reputation of our country in the realm of aeronautical engineering would have been far greater than it is to-day. Although for very apparent reasons it is not trumpeted abroad, the French manufacturers rely upon data obtained from models to a very much greater extent than is commonly believed in this country. The various model associations in France receive extensive financial aid from the French firms, and it is no uncommon thing for a prize of 500 francs to be awarded in a model aeroplane competition. This is not done for motives of philanthropy, but simply because the firms realise, as many of ours do not, the practical value of the model. The promoters of the Federation, as well as myself, have every faith in the value of the flying model to aviation, and we are prepared to extend every assistance and encouragement to those of our members who are experimenting on scientific lines. We are arranging next year a series of competitions on sound lines and for really substantial prizes, and we furthermore undertake to put any really good and original ideas before those of the British firms who are favourably inclined towards this aspect of aviation.

Members please address all correspondence to 15, Arlington Road, Surbiton.



# A Study of Bird Flight

By Dr. E.H. Hankin, M.A. DSc.  
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## CHAPTER XXIV.—Movements of the Outside Wing Tip in Circling.

I HAVE already described steering movements of the inside wing tip in circling vultures. I have now to describe certain movements of the outside wing tip still more difficult to observe, and whose meaning is obscure.

An example of my first observations relating to this matter is the following:—

March 7th, 1910.—At 1.0.—A large group of vultures circling in Taj Gunj direction. They were from 100 metres up and upwards. Several showed windward dip strongly marked, and also slight arching of outside wing on the windward side of the track.

At first I regarded this movement of the outside wing as identical with the arching that I had already observed in cheels. But

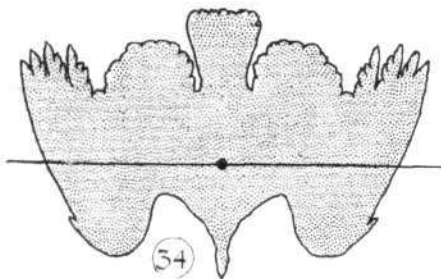


Fig. 34.—Outline of a vulture when diving. Span when wings extended, 85 ins.; span when diving, 40 ins.; weight of bird, 5,520 grammes. The transverse line is drawn through the centre of gravity.

I gradually noticed that this arching, unlike that of cheels, only affected the outer part of the wing. Then as I became more familiar with the appearance, I recognised that this false arching was of the nature of a "half-dip movement." But it was only when I arrived in Naini Tal that I was able to make conclusive observations that showed that the false arching in question was of the nature indicated.

The following are indications of my Naini Tal observations:—

June 19th, 1910.—At Ballia Ravine, 12.30.—A black vulture circling showed windward dip (that is to say, of inside wing) on windward side of track. This was seen to be followed by a slight half dip of outside wing.

June 22nd, 1910.—At Ballia Ravine, 3.45.—A vulture circling with wings nearly flat showed windward dip followed by a half dip of the outer wing. This was again seen shortly afterwards. There were a few small cloud shadows. I formed the impression that vultures circling in sunshine had wings dihedrally up, while the one or two vultures seen circling with wings flat were in shade.

At Ballia Ravine I noticed that, in circling, besides windward and leeward dips, other small dip movements of the inside wing occasionally occurred. In addition, the windward and leeward dips were often followed by slight dip movements of the outside wing tip. These usually last longer than the previously described movements of the inside wing. A half dip of the outside wing may last for several seconds.

These movements of the outside wing tip occur more frequently than otherwise on the windward side of the track, that is to say, at that portion of the circle where there is most canting, and presumably most steering. That is to say, the outside wing tip is occasionally rotated downwards at a time when it should be rotated upwards, if Wright's method played a part in steering movements.

But the movement of the outside wing tip does not seem to be, or always to be, simply a half-dip movement. Occasionally, at least, it is combined with slight retirement of the phalangeal quill feathers. This gives the wing tip a rounded appearance. For instance:—

August 17th, 1910.—At Jharna Nullah. At 11.50.—Sunshine increasing, and circling of larger birds beginning. Adjutants circling with occasional flapping. Light wind.

Some adjutants circling showed clearly rounding of outside wing tip on windward side of track. This was seen three times. Twice also a very slight rounding, merely a slight retirement of the first phalangeal quill was observed.\*

\* No doubt the succeeding three phalangeal quills were also retired. But it was only in the case of the first quill, thanks to its position, that the movement could with certainty be distinguished.

12.6—Adjutants circling overhead a short way up showed half dip of outside wing along windward side as a depression of first phalangeal quill only. This was often combined with a slight retirement of this feather. This latter movement (extent probably about an inch) was presumably an indication of very slight relaxation of secondaries. It could only be seen when the birds were directly overhead or slightly to windward. As soon as they had drifted past to leeward, the quill feathers seemed to approximate, owing to their being seen foreshortened.

12.50.—Two miles along Tundla Road, beyond Jharna Nullah. An adjutant circling, in nearly complete calm, and well canted over, showed on each of several circles observed, slight alula (perhaps a little more than half an inch) of inside wing on up wind side of circle. While I was watching it the wind increased. The bird then circled with its wings not quite fully extended. No advancement of the alula then occurred. The bird was not so canted as previously. Presumably it was ease-circling. The advancement of the alula, when it occurred, was quite definitely and clearly seen. The bird showed scarcely any leeward drift, so there could not have been much wind at the height at which it was circling.

On one other occasion I have seen advancement of the alula in an adjutant.

The above is the only instance in which I have definitely noted in my diary that the wing tip was retired during the half dip of the outside wing. It must be obvious that both these movements are very difficult to see. The retirement is best seen when the bird is directly overhead. The dip, on the other hand, would be more easily observed when the bird is seen from the side. But the following instance suggests that the two movements are combined:

November 13th, 1910.—At Jharna Nullah.

9.53.—Vultures began circling.

10.14.—Vultures began slow flex-gliding.

10.24.—No half dips or retirement of outside wing tips have been seen as yet, though I had looked carefully for these movements.

10.30.—Besides columns of birds circling and drifting to leeward, vultures were now circling without leeward drift over the slaughter-house. Previously, all circling vultures had shown leeward drift.

10.33.—Vultures seen flex-gliding at medium speed.

10.35.—A vulture seen fast flex-gliding.

10.46.—Many, perhaps a hundred, vultures started to windward of me and drifted overhead at a height of 20 or 30 metres. They were gaining height rapidly. They showed many half dips and retirement of outside wing tips. These occurred both on windward and leeward sides of the circle. They were seen in every vulture that could be observed.

11.32.—Vultures now were circling for the most part with wing tips of both wings slightly retired. This is ease-circling. It had not been observed previously. But vultures at lower levels were circling with wings slightly advanced or straight (tips not retired) and occasionally flapped.

A long time before making these observations, I had noticed in circling vultures that the quill feathers of the outside wing tip were occasionally not as fully extended (that is to say, advanced) as those of the inside wing tip. I was, at first, of opinion that this was a sign that the outside wing did less work in circling, and that, consequently, the bird did not find it necessary to use the muscular exertion necessary for full extension. In view of the facts now described, it appears more probable that this lack of full extension is a sign of slight decrease of camber of the outside wing, which decrease, it may be surmised, is favourable for the relatively greater speed of the outside wing when the bird is travelling on a curved course. When describing my observations in Naini Tal, I mentioned certain cases in which I was able to see a decrease of camber of the outside wing in circling, as evidenced by a slight relaxation of the secondaries. Presumably these cases were of half dips with retirement of the outside wing tip. The fact that while observing the relaxation of the secondaries I made no note of any movement of the wing tips, proves nothing. The relaxation was so very difficult to see that all my attention must have been concentrated on the hind margins of the two wings. Small movements of the wing tip may well have been occurring at the time.

Thus, the exact nature of the movement of the outside wing tip in



circling is still a matter of inference rather than of observation. There is still more doubt as to the significance of the movement. If I am right in supposing that the wing tip retirement is due to carpal and not to metacarpal flexing, then perhaps the movement is some kind of adjustment for steering in a direction opposite to that which would be produced by a full dip movement of the same wing. For instance:—

September 4th, 1910.—At Jharna Nullah, 11.3.—A vulture seen to change from slow flex-gliding to circling by retiring of outside wing tip. No dip of inside wing took place.

The facts hitherto brought forward make it probable that birds possess two distinct methods of steering in the horizontal plane. Facts to be described in Chapter XXXIII will be found to prove definitely that this is the case, and to suggest a simple explanation as to why two methods of steering are required.

#### CHAPTER XXV.—Observations on a Deformed Vulture.

ANY theory that the use of Wright's method is indispensable for soaring flight must be regarded as disproved by the following observations on a deformed vulture.

The view that lateral stability in birds is produced by a twisting upwards of one wing tip, as the other is twisted downwards, involves a corollary, namely, that in the absence of a balancing movement the wing tip is not so twisted. The deformed vulture, whose movements I am about to describe, has the phalangeal quills of one wing permanently rotated upwards, and apparently immovably fixed.

On the 18th June, 1910, at Naini Tal, I saw a large, brown vulture circling near the top of Sher-ka Danda Mountain. Just before it glided over the crest of this mountain out of sight, it made a circle, which I observed carefully. In so doing it made a dip movement of the right wing. During the time of this dip I noticed that the tip of the left wing was directed upwards to an unusual degree. I thought at the time that I had at last seen Wright's method in use. But on the following day I got a better view of this vulture, and soon saw that the turning up of the left wing tip was due to a deformity. I saw this vulture on several occasions. A few of my observations are comprised in the following extracts:—

June 19th, 1910.—Ballia Ravine, 11.54.—The deformed vulture again started. When turning to the left, half-dip movements of the right wing were observed four times, each half dip being followed by a change of course. After I had made these observations, the bird glided into a cloud and remained out of sight.

June 22nd, 1910.—At Ballia Ravine, 4.55.—The deformed vulture watched through the binocular for about five minutes. It was circling over a hill at about a mile's distance, being only just visible to the naked eye. It always circled with the efficient wing on the inside. Sometimes it turned in the other direction, so that the efficient wing was outside, but this was always only for a short time, and without completing a circle. After circling for several minutes, it ease-glided for about a mile, and went out of sight behind a hill. While ease-gliding, the efficient wing tip was never seen turned up. It seemed to be permanently directed slightly downwards. Dip movements of the efficient wing tip were seen, but at the distance at which it was flying half dips could not be distinguished.

June 29th, 1910.—At Ballia Ravine, 2.55.—The deformed vulture seen circling below my level in the valley below the Brewery (distance of Brewery from me 5,300 feet). While circling, the efficient wing was on the inside, and showed frequent dips of more or less amplitude. The efficient wing tip was always either depressed, or perhaps sometimes horizontal. (Note.—If horizontal, there must have been air pressure on the under side of the phalangeal quills). After a few circles had been observed, the bird reversed, so that the bad wing was on the inside. It only made one circle in this direction, during which circle the efficient wing tip remained turned upwards except during two small dips (Figs. 35 and 36). The vulture then reversed to its original direction of circling. A minute later it again made a circle in reverse direction showing the same disposition and movements of the efficient wing tip. Shortly afterwards, during a circle with the efficient wing, as usual, inside, the efficient wing tip was seen to make two dips, one large and one small (the latter presumably a half-dip). The bird then glided out of sight.

3.5.—The deformed vulture again seen. It was observed to turn the efficient wing tip upwards for making a turn.

July 1st, 1910.—Ballia Ravine. At 10.25.—The deformed vulture seen circling with the good wing tip as usual, inside. It

raised (rotated up) this wing tip for making a turn, that is to say, for steering in the horizontal plane, preparatory to ease-gliding up the valley.

It must be obvious that the facts described in this and the preceding chapter give ample room for discussion as to the functions of the wing tips. It is to be hoped that the matter may be further elucidated by later observations.

#### CHAPTER XXVI.—Flapping Flight. The Poising of the Pied Kingfisher.

IT will be found that the study of flapping flight throws an unexpected light on several problems connected with gliding flight.

A difficulty in understanding flapping flight lies in the fact that the bird may, at one and the same time, be making movements



Fig. 35.—Deformed vulture circling with efficient wing tip inside.



Fig. 36.—Deformed vulture circling with efficient wing tip outside.

having different objects; for instance, movements of propulsion, movements in opposition to gravity, movements for balance, and movements for directing its course. In addition, there may be movements or adjustments for checking speed independently of those used before perching.

It is necessary to find a simple form of flight in which the propulsive movement may be studied alone. This desideratum is supplied in a very satisfactory way by the poising of the pied kingfisher in calm air.

The pied kingfisher (*Ceryle Rudis*) differs from other species of kingfisher in having a habit of poising in the air and then suddenly diving down head foremost on to its prey. While poising, the bird appears as if fixed in one position, with its wings in rapid motion. It may remain thus poised for several seconds at a time.

The following measurements were obtained from a specimen of this bird:—

Weight	90 grammes, say 3 ozs.	Area of wings	352 sq. ft.
Span	18 ins.	Loading	76 lbs.
Length	11½ "		

In the case of the pied kingfisher poising in still air, since the wings are propelling it vertically upwards, the propelling movement has no admixture with any other movement or disposition for counteracting gravity. Also there are no directive movements, as the bird is not travelling from place to place.

If a pied kingfisher is watched under these conditions, it will be seen that the movement of the wings is not up and down, but to and fro in a perfectly horizontal direction. It will be convenient,

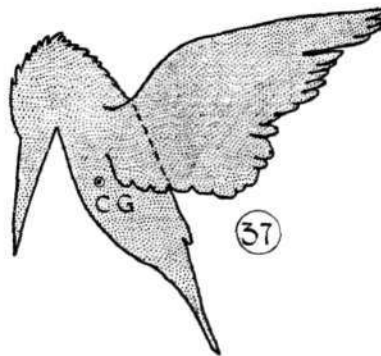


Fig. 37.—Pied kingfisher poising at commencement of down stroke

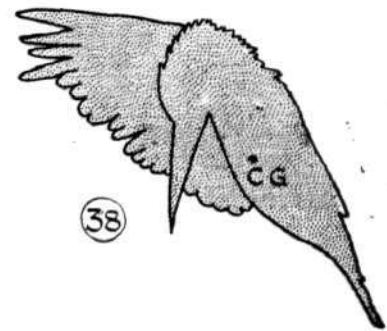


Fig. 38.—Pied kingfisher poising at end of down stroke.

however, to use the terms "up stroke" and "down stroke" in describing the movement of its wings.

Fig. 37 shows the position of the wing at the commencement of the down stroke. Fig. 38 shows the position at the end of the down stroke.

During the down stroke, as shown in Fig. 39, the wing is moving horizontally forwards. The quill feathers, by the pressure of the air, are bent backwards. The area of the wing, therefore, forms a slanting surface. The pressure of the air on this slanting surface results in a component tending to lift the bird.

The position of the wing during the up stroke is shown in Fig. 40.

Partly owing to the pressure of the air on the feathers, perhaps partly also to the wing having been slightly rotated, the area of the wing now forms an inclined plane, inclined in the opposite direction. As in the former case, there is a resultant force tending to lift the bird.

Because the bird remains in the same place, the lift on the down stroke must equal the lift on the up stroke. If, owing to its shape, the area of the wing is less efficient in lifting on the up stroke, then this lack of efficiency must be compensated by greater speed. Whether or not this is the case in the pied kingfisher it is not

fisher resembles a horizontally-placed propeller whose blades reverse every half-revolution.

Fig. 43 represents a pied kingfisher poising, not in calm air, but in a wind. Under these conditions the direction of the strokes of the wing is no longer horizontal, but slightly inclined to the horizon. The arrow W represents the wind direction. The arrow R represents the direction of the propelling effect of the wings. As in the first case, it must be obvious that propelling work is being done on the up stroke besides on the down stroke.

I was once watching a pied kingfisher poising in a calm. It

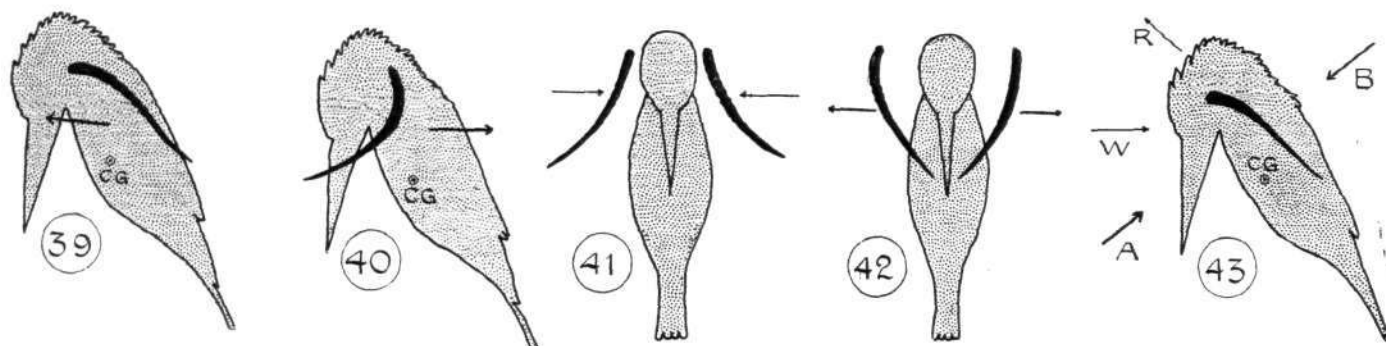


Fig. 39.—Position of wing of poising kingfisher during down stroke. Fig. 40.—Position of wing of poising kingfisher during up stroke. Fig. 41.—Front view of poising kingfisher near end of down stroke. Fig. 42.—Front view of poising kingfisher at beginning of up stroke. Fig. 43.—Side view of kingfisher poising in a wind. The arrows, A B, show direction of beat of wings, C G centre of gravity, W direction of wind, R direction of propelling force of wings.

possible to see, owing to the extreme rapidity of the beats when poising. But in the case of some larger birds, and in the case of the flying fox, I have been able definitely to observe that the movement of the wings when in horizontal flight is faster on the up stroke.

In the poising pied kingfisher the strokes are of much greater amplitude than they are in ordinary horizontal flapping flight. At the end of the down stroke the wings nearly meet in front of the body. At the end of the up stroke the wings nearly meet behind the back. Fig. 41 shows the bird as seen from in front when the wings are coming together near the end of the down stroke. It must be obvious that the two wings, when approaching, tend to squeeze out air from between them in a downward direction, thereby, in a small degree, aiding the lifting effect. Fig. 42 shows the bird, again as seen from in front, when the wings are receding from one another at the commencement of the up stroke. Owing to their movement there must be a tendency for the air to be sucked in from above. That is to say, there is again a slight addition to the lifting effect.

It must be obvious from this description that the poising king-

fisher was struck by a puff of wind, as shown by ripples that appeared on the water below it. The consequent change in the direction of the beats of the wings could be clearly seen. Owing, no doubt, to this change, the bird was not blown to leeward, but retained its position.

When the pied kingfisher is flying from place to place its mode of flight is quite different from that seen in poising. The long axis of the body is horizontal (or nearly so), instead of being strongly inclined as in poising. The direction of the beat of the wings appears to be vertically up and down. The rate and also the amplitude of the beat is lessened.

So far as we have gone in considering flapping flight, everything appears to be explained with one important exception, namely, what is the adjustment by means of which the kingfisher can change from poising to cross-country flight? Obviously, to do so, the bird has to rotate round its transverse axis. The method of rotating round this axis that is used in gliding flight is clearly not applicable. The discovery of the method used in flapping flight will be described in the next chapter.

(To be continued).

## AIRSHIP NEWS.

### The Naval Airship Disaster.

THE fact that Mr. McKenna, First Lord of the Admiralty, and Lord Haldane, Minister of War, were present at the opening of the inquiry on board H.M.S. "Hermione," on Wednesday of last week, into the disaster to the Naval dirigible points to the importance which is attached to the event at headquarters. The Commission consists of Rear-Admiral Sturdee, chairman, Capt. Nicholson, and Mr. Whiting. Before the proceedings opened, a visit was made to the wreck of the airship. Some 200 Marines were examined by the Commission as to their knowledge of the accident, and among others present at the inquiry were several aeronautical experts from the Admiralty and three of the Army airship officers.

### The "Schwaben's" Record.

DURING the 54 days she has been in service the Zeppelin liner "Schwaben" has made 81 ascents, and this includes nine long voyages ranging from 200 to 400 kilom. She has been in the air for 187 hours altogether, has covered 10,811 kilom., and carried 1,675 persons. It is proposed in a few days to make an excursion from Dusseldorf into Holland, and then in November the vessel will return to Frankfort, where she will be permanently stationed.

### "Schwaben" goes to Dusseldorf.

On the 13th the Zeppelin liner "Schwaben" left Baden Baden with five passengers on board, and passing by Heidelberg and Darnstadt reached Frankfort after a trip of 3 hours. A stop was made there for just an hour and then via Mayence, Coblenz and Bonn, the dirigible went on to Dusseldorf, which was reached after 3½ hours. During this time the misty conditions made steering a

difficult task, and several times the vessel got off her course. The full distance covered was about 300 kilom.

### "Parseval VI" Returns to Bitterfeld.

AT half-past ten on the morning of the 13th, "Parseval VI" was brought out from her shed at Johannisthal and sailed over to Bitterfeld, the journey taking about three hours.

### The "Schutte-Lanz" Makes its Début.

AT last the "Schutte-Lanz" dirigible, which it will be remembered is of the rigid type with a wooden framework, has made its appearance in the open, it having made a short cruise on Tuesday last. The wooden framework is 430 ft. and 60 ft. diameter at its biggest section. Extensive experiments in wireless telegraphy are to be carried out with this airship.

### A Long Voyage by "Adjudant Vincenot."

ON the 6th inst., the Clement Bayard dirigible "Adjudant Vincenot" was brought out of its shed at Lamotte Breuil and was sailing for just on three hours over Soissons, Courcy-le-Chateau and Compiègne. She carried a crew of eight persons.

### The New Transatlantic Dirigible.

SOME particulars are to hand of the new dirigible "Akron" with which Mr. Melvin Vaniman proposes to attempt a transatlantic trip this month. The envelope has been made by the Goodyear Tyre Co., of Akron, and is 268 ft. long and 45 ft. diameter at the largest section. It is made up of 2,200 pieces of fabric 1'03 in. thick, consisting of three layers of cotton cloth interleaved between four layers of rubber.



## FROM THE BRITISH FLYING GROUNDS.

## Brooklands Aerodrome.

FOG has been much in evidence at Brooklands during the past week, preventing any attempts on the Michelin Cup by the pilots who have been holding themselves in readiness down here. Thursday was one of those fine still days which we look forward to in the autumn, but was marred, unfortunately, by the accident to E. V. Fisher and Johnson on the Vickers monoplane. There was just a slight haze after breakfast when Fisher brought his machine out for a spin. It flew very nicely for a few circuits, and Fisher decided to try and take a passenger. Accordingly Johnson climbed into the passenger seat and they started off. The machine did not seem to rise very quickly, and was only about 50 feet when it was necessary to turn. Those watching saw the machine bank over heavily, slide in and dive on to its nose, completely wrecking itself. Fisher was taken off the ground unconscious, but I am glad to be able to report that he is progressing very favourably now, having sustained a slight concussion, whereas Johnson is about again as lively as a cricket.

Kemp was out on the Flanders monoplane flying circuits at about 60 ft. He intended going for the Michelin, but it was found that various adjustments were required, and so the only fine day of the week was unfortunately lost. Raynham on the Avro was flying about 500 ft., but was not satisfied with the propeller, as the engine was revolving too quickly. Chataway, of the Deperdussin School, was making good straight flights, and Baldwin and Sabelli were following on the taxi.

The Elephantoplane was making half circles over the river, but had to adjourn owing to a broken valve rocker. Pizey, the Bristol pilot, was giving instructions to Capt. Harrison and afterwards to Maj. Benwell, and Lieut. Harford made some good straight flights. Mrs. Hewlett and Blondeau were flying on their British-made Farman, the latter at about 10 ft. off the ground in his usual style. Longstaffe, the Howard-Wright pilot, rose to about 500 ft. on his machine, going very strongly. In the evening the Deperdussin School swarmed out, Capt. Richey, Garne and Chataway doing circuits in fine style.

Chataway had rather an exciting experience. After flying a circuit he attempted to land, but found that the short-circuiting wire to the magneto had broken loose, so that he could not switch off. Seeing the sewage farm looming up before him, he was struck by the brilliant idea of crawling inside the body and turning the petrol off. He was lucky; he brought the machine to rest about 1 ft. off the farm! Lieut. Chinnery made some good straight flights; we expect to see him doing circuits soon. Raynham took the Avro biplane out for a spin, and afterwards handed the machine over to S. V. Sippe, who flew a few circuits at about 300 ft. Kemp came out with the Flanders monoplane, and flew for some time. The Elephantoplane essayed a circuit, but, unfortunately, when over the sewage farm, the engine dropped a few revolutions. Blackman valiantly tried to keep the machine up, but it was no good, and it settled down, luckily on a fairly dry patch. However, practically no damage was done, only a couple of wires being broken. This says a good deal for the soundness of construction and strength of the machine. Maurice Ducrocq came out, and disappeared in the direction of Weybridge, returning later, after having made a big circuit over the surrounding country.

Friday was very foggy, but this did not prevent Ducrocq and Raynham from testing their machines. Later on in the day the fog grew very thick, but Ducrocq took a passenger round several circuits. The machine was quite invisible at about fifty yards. The Birdling monoplane was having an engine test, and was not running at all satisfactorily.

Saturday morning was rather misty. Raynham wanted to go to Hendon to start for the Michelin, so went up 1,000 ft. to see if the fog was too bad for cross-country work. He decided it was, and so came down to wait for it to lift. Sad to relate, the fog steadily grew worse. Spencer was out flying several circuits, and afterwards Frank Ballard made some good straight flights. Pizey took up Major Benwell and Capt. Harrison, and Kemp flew a few circuits on the Hardens.

During the morning Lieut. Harford, one of the Bristol pupils, was told by his instructor, Collyns Pizey, that he could attempt a turn. He went up, and after making one circuit decided to do a figure 8. This he successfully accomplished in good style, though he was rather low.

Owing to the weather, Sunday and Monday were, so far as flying was concerned, *dies non*.

Tuesday was very windy until about 5 o'clock in the evening, when Fleming, of the Bristol school, made a couple of circuits. Afterwards Capt. Harrison had some rolling practice. Rippen brought out the Hanriot for the first time for a month or so, but it was rather dark, and the smoke from the engine got in his eyes, and

he finished up on the sewage farm. However, no damage was done, and the machine was got out in about 10 minutes.

Bell did some circuits on the 28-h.p. Deperdussin in the evening, and on Sunday morning Raynham flew a few circuits on the Avro biplane.

The latest departure of the Deperdussin firm made its appearance this afternoon. It is more or less a pocket edition of an aeroplane, having an exceedingly small span and length. It is fitted with the latest 28-h.p. Anzani, and is credited with a speed of 70 m.p.h. Mr. A. V. Roe has decided to dismantle the Farman, which has carried off so many prizes this year, and fit the Gnome engine into the Avro biplane which will be built to suit it. T. Sopwith's Howard-Wright has arrived from America, and his Blériot two-seater and Wright are expected shortly. It is expected that he will go for the Michelin distance prize.

## Filey School (Blackburn Aeroplane Co.).

ON Tuesday last week Mr. H. Scott, who has recently joined the Filey School, made his first trials alone. He was out doing useful rolling practice for about 3½ hours continuously. Altogether he put in a very good day's work, at the termination of which he could keep a straight course at full speed with tail well up.

Wednesday opened out an ideal day, flying being in progress for no less than 5 hours. At 10 a.m. two of the school 'buses were brought out, one being Mr. H. Oxley's passenger machine on which pupils make their first passenger flights with the instructor. The seats on this machine face each other, so that the pupil can watch all the movements of the instructor. Mr. R. J. Weiss was the first passenger with Mr. Oxley. It will be remembered that Mr. Weiss was a pupil some time ago, but after a very short stay, he had to leave the school on business. He has now returned to resume his tuition course. Mr. R. Blackburn (the designer of the Blackburn monoplane) next went up as a passenger, and took some very interesting photographs whilst flying at a height of 100 to 150 ft. Scott then made one or two trips with Oxley, after which he went out alone on the other machine. He put in about three hours' rolling practice, which may be considered a fair time for one day's work. Oxley made fourteen passenger trips in all, carrying Mr. Metcalf, a



Mrs. de Deauvoir Stocks, who is flying so well at the Grahame-White School at Hendon. Mrs. Stocks hoped to qualify officially for her certificate this week.

resident of Filey, also the first lady passenger in Yorkshire, Miss Cook.

Oxley made several very fine flights with passengers on Thursday, including flights with pupils. Scott again did about three hours' rolling practice, Weiss also putting in some practice on the Isaacson-engined machine. Although he was not accustomed to so much power, he controlled the machine very well, and hopes shortly to be making circuits with her.

On Friday Scott was out rolling for nearly four hours. He is very keen for every opportunity of getting out, and hopes shortly to be doing straight flights. Weiss was also out doing good work, Oxley again making several fine passenger flights, as also on the Saturday, this time making trips with pupils as the wind was rather too strong for their going out alone.

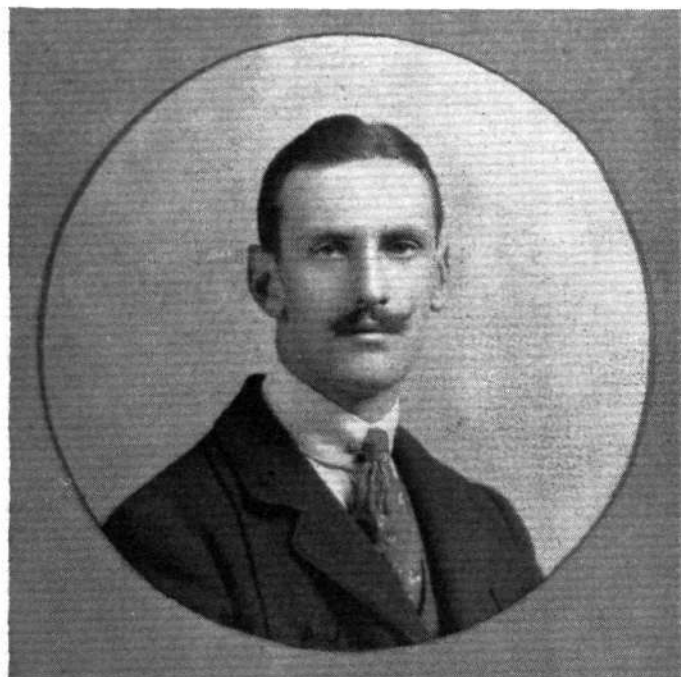
## Freshfield Aerodrome, near Liverpool.

MR. G. HIGGINBOTHAM, who has made himself such a name by his flying at the Freshfield Aerodrome, recently duplicated in a small way the scheme carried out in connection with the aerial post at Hendon. In similar fashion he arranged to inaugurate an aerial post from Freshfield to Southport by aeroplane. Directly it was known he contemplated this, a big bag of cards and letters was made up in the district by his friends and others, and these were duly endorsed with the aerial post stamp, ready for conveyance to the post office. Mr. Higginbotham made a start from Freshfield with his freight at about four o'clock on Friday afternoon last week, carrying with him his mechanic, and was quickly at Southport, where he landed on the shore. After disposing of his burden at the post office, he returned to Freshfield in seven minutes, the distance being about 8 miles. On the journey, fog was rather bothering, rendering it difficult to find the way near Southport. The occasion was noteworthy by reason of its being Mr. Higginbotham's first flight of any distance since he had his little accident a little time back through finding an air pocket over the sea, when he had to swim for it, as recorded in FLIGHT at the time. Incidentally it may be mentioned that Mr. Higginbotham parted with a portion of his ear upon the occasion. We give on page 918 a photograph of Mr. Higginbotham's machine, taken from one of the aerial post-cards carried by himself.

On Saturday last Mr. Higginbotham was in the air again at Freshfield, carrying Mr. A. Pochin, a new aviator at the aerodrome. Later he also took up Mr. Pochin's mechanic for a trip.

## Lanark Aerodrome.

ON Monday last week Warren was in the air on the school machine making complete circles for the first time, at a height of



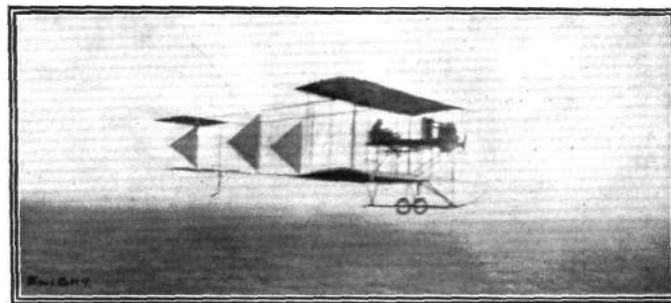
Mr. L. Seymour Metford, who has just secured his R.Ae.C. certificate at the Blériot School at Hendon.—Mr. Metford, who is the tenth pupil who has passed through the various stages of instruction at the Blériot school without any breakages whatever, is a member of the London Rifle Brigade, and is the first Territorial to obtain his *brevet* on a monoplane.

about 50 ft. He kept the machine very steady and seemed to quickly acquire the necessary "knack." His landings were particularly good, an important item. Afterwards he tried a figure eight turn, but did not complete it on account of a gusty wind taking a hand in the evolution.

On Thursday afternoon Ewen had the Deperdussin out and indulged in a short flight at a height of 400 ft. The same afternoon the aerodrome was visited by the Under Lord-Lieutenant of Lanarkshire, who was greatly interested in the flying. Afterwards he made careful inspection of the machines under the guidance of Mr. Ewen, and left very much pleased with his experience, emphasised by his expressed intention of again visiting the school at an early date.

## London Aerodrome, Collindale Avenue, Hendon.

Blériot School.—A good deal of time was wasted during last week on account of wind and foggy weather, but the pupils were



Messrs. Walton and Edwards' biplane in flight at Brooklands.

not idle and made good use of the fine intervals when they did come.

On Thursday and Friday Messrs. Driver, Parr, Slack, Tremlett-Prensiell, Sacchi and Allen were all out practicing, the first named making some pretty flights which showed that they could pass the trials for their certificate without much trouble.

On Saturday Mr. Driver flew three times round the aerodrome at a height of about 250 ft., finishing each time with a *vol plané*, Mr. Parr following him with exactly the same evolutions. Mr. Slack is now quite able to take care of himself in the air, even in a good breeze.

On Thursday, in a very thick fog, Mr. Salmes, instructor at the school, made a very fine flight on his Gnome-Blériot, and on Saturday afternoon went for a long cross-country flight, being away over half an hour. Mr. Abercromby was also putting some good practice on the Blériot, fitted with the new 30-h.p. Anzani on Thursday, making some steady flights round the aerodrome.

The latest model Blériot two-seater, with a 70-h.p. engine, on which Mr. Hamel flew the Channel on Thursday, is now at the Blériot School at Hendon, and passenger flights will take place every fine day during the next few weeks.

●Grahame-White School.—On Tuesday of last week, Mrs. Stocks came out in the evening on the Gnome-Farman, and made a flight of a quarter of an hour's duration at a height of 150 ft., landing well, despite the failing daylight. The weather on the following day was unsuitable, and consequently no flying could be undertaken. On Thursday afternoon, however, Lieut. Parke flew the school Farman for one and a quarter hours, terminating his flight with a magnificent spiral *vol plané* from an altitude of 400 ft. In the evening Mrs. Stocks again flew for five circuits, following which Lieut. Parke gave instruction to Fowler by giving him two passenger flights, each of five laps of the aerodrome. To complete the day's proceedings Mrs. Stocks ascended to a height of 200 ft. and circled the ground. On the next day the fog cleared off in the afternoon, and soon after 3.30 Lieut. Parke brought out the school Farman, and took Fowler for a passenger flight of 15 minutes' duration. Later on Mrs. Stocks made an ascent, and flying for 20 mins., made several complete figures of eight and right-hand circles, banking well. Just before dark, Lieut. Parke carried a passenger for several laps of the aerodrome, after which Fowler took a spell of rolling with the instructor in the passenger seat. Mrs. Stocks, who is now ready to take her *brevet*, carried out further practice flights on Saturday afternoon, flying for half an hour at a height of 500 ft., making right-hand turns and figures of eight.

Valkyrie School.—Mr. Barber on Tuesday last week had out the new "Valkyrie 11" for its first trial flights, and made a number of circuits most satisfactorily, the balance being perfect, and no adjustments being required.

At 7 a.m. the next morning, Capt. Loraine took advantage of a temporary lull in the wind, and made several good straight flights.



Unfortunately he was only able to get a few minutes' practice before the wind rose again. At 4 o'clock, Mr. Barber took charge of the new "Valkyrie 11" again, and put up several magnificent exhibition flights. Sharp right and left-hand turns, and numerous spiral *vol plans* were negotiated in order to test the new machine. Owing to the fog an altitude of 300 ft. was not exceeded. At 5.30, Capt. Loraine was upon the school machine and flew in his usual excellent style, landing faultlessly; then handing over the machine to Chambers, the latter also making several successful flights, but unfortunately he got into some very rough ground, necessitating a stoppage, with the result that some wires had to be adjusted. At the same time the school pilot ascended on No. 10, fitted with auxiliary fuel tanks, carrying in all 22 gallons of petrol and 12 gallons of oil. The machine rose remarkably quickly, but thick fog made a lengthy flight impossible, and he descended after four or five circuits had been accomplished.

Captain Loraine was at work at 4 p.m. on Friday on the school machine, flying well and steadily in a puffy wind. Mr. Barber then ascended on "Valkyrie 11," but was soon forced by a rain storm to descend.

In spite of some wind there was a big day's work accomplished on Saturday at the Valkyrie school, from 11 a.m. till sunset. One machine or another was in the air almost continuously. Mr. Barber opened the day with a fine 30-minute flight on No. 10. Meantime Captain Loraine put in some good practice on the school machine. For two hours Mr. Barber flew continuously on "Valkyrie 10 and 11" alternately. Before lunch Ridley-Prentice made several short flights on the school machine, and Captain Loraine had another 15 minutes practice. At 2 p.m. Mr. Barber ascended for a long flight on No. 10. He rose to well over 1,000 ft., and flew off in the direction of Harrow, and after making several very effective spiral *vol plans* over the Edgware Road, he again rose to 1,000 ft. and flew over Hendon towards Golder's Green, eventually landing after a splendid corkscrew spiral *vol plané*. At 2.30 Capt. Loraine ascended on the school machine and made a fine flight of 25 minutes duration at an altitude of 200 ft. Twice he made the length of the ground with both hands off the controls and above his head. Later Ridley-Prentice carried out a fine circular flight flying with his old steadiness and confidence. Capt. Loraine then took over the machine and made six circuits; once more his flight was of an exhibition character, letting go the controls for quite a long period. Chambers then made several flights. All the afternoon Mr. Barber was flying Nos. 10 and 11 alternately, and towards dark gave a passenger flight to Miss Trehawke Davies.

#### Portholme Aerodrome, Huntingdon.

MR. MOORHOUSE, when he left Brooklands on Wednesday last week about 4 o'clock, absolutely lost himself in the mist until he reached Harrow, making three circuits of the town, then making for Bushey, where he made another three circuits. He then followed the Midland Railway to Hatfield, and taking the Great Northern line followed it to Biggleswade, where he again was lost in a fog; again sighting the line, thinking it was still the Great Northern, but it turned out to be the London and North Western to Cambridge, where, as recorded last week, finding himself over houses, with petrol run out, he had to make a landing. Recognising Parker's Piece, he planed down, making a perfect landing, with petrol tank dry, at 5.40 p.m., being then dark.

The machine was then secured and covered up for the night. Leaving Cambridge at 6.30 a.m. on the 12th, he arrived at Huntingdon at 6.39 a.m., a distance of 15 miles. Later in the day he flew from Huntingdon round Peterborough and back without alighting, taking 27 mins. for the journey. After lunch he flew to Cambridge, where he had tea with friends.

Friday was devoted to testing the machine for weight-lifting and



#### Mr. Hamel Crosses the Channel.

A FINE cross-Channel trip was made on Thursday of last week by Mr. Gustav Hamel. He paid a visit to M. Blériot at his country residence at Hardelot, near Boulogne, in order to take delivery of a 70-h.p. two-seater Blériot monoplane, and started away from France at half-past one in the afternoon. Rising to a height of 8,000 ft., he set out for Folkestone, but was much impeded by fog, and in mid-channel could not see either coast, but he flew on, however, over the English coast and continued on inland to Canterbury. There he dropped down to 5,000 ft. and decided to alight in order to check his whereabouts. The first opportunity to land came just by Maidstone, and after a safe descent he rested there for half-an-hour before restarting for his destination at Hendon. Steering by compass he made his way to the Thames, and flying directly over the river he went from Greenwich to the Ealing district before turning off for Hendon. All this time he found the fog very confusing,

general drome flying. Next day general instructions were given to a new pupil, Mr. W. Roberts-Bruce, who seems very promising. There are already four pupils at the school. In the evening Mr. Moorhouse went up for a flutter in a 30-mile wind.

#### Salisbury Plain.

**Bristol School.**—A terrific gale was blowing on the morning of Monday last week, which continued for the rest of the day, thus rendering flying impossible.

On Tuesday the wind of the previous day had not abated, and the idea of flying had to be abandoned for the morning. In the evening things improved somewhat, and, after an ascent to test conditions, solo flying and school work was tackled in real earnest, in which all the pupils took part.

The morning's work started off briskly on Thursday, by Prier taking Jullerot for a flight of 10 minutes on the new two-seater monoplane, attaining a height of 600 ft. Messrs. Smith, Barry and Busted were also given similar flights, and great satisfaction was expressed at the splendid stability of the machine. Pixton on No. 43 took Lieut. Dacre for a flight of 12 mins. Solos were made by Lieuts. Hooper (two), and Cross, Messrs. Lee and Smith Barry (two). Mr. Lee then passed both tests for his certificate, showing excellent knowledge of the controls. Pixton ascended with Lieut. Burney, R.N., who had observed Mr. Lee's flights, landing after having completed a circuit. In the evening Lieut. Hooper passed the first part of the test for his certificate. Lieut. Cross carried out two very successful solo flights, attaining a height of 400 feet in each instance. Pixton took Lieut. Dacre out and gave him instruction in landing, after which he took up another passenger. Mr. Smith Barry performed a good solo in fine style, landing in the dusk. Gilmour then made a flight in the single-seater monoplane, completing a circuit, afterwards doing a long solo in the double-seater. Prier, brought an excellent day's work to a close by taking Mr. Lee for a flight in the new two-seater monoplane.

Pixton started off the Friday morning's work by making a flight with Lieut. Dacre. Messrs. Mellersh and Smith Barry, Lieuts. Cross, Hooper and Joseph each made solos of 15 mins. Gilmour went for a solo in the new two-seater monoplane. Mr. Lee passed his height test successfully, thus finally qualifying for his certificate. The Bristol Co. in this way secured the honour of turning out China's first certified aviator. Lieut. Hooper also passed the remainder of the tests for his certificate. This officer's tuition lasted exactly 4 weeks, 4 days, he having joined the school on September 12th. It should be borne in mind, however, that flying has been restricted owing to the inclemency of the weather. The work was much hindered through the presence of a fairly thick fog. In the evening Lieut. Joseph made a short solo; Mr. Mellersh went for a flight of 10 mins.; Busted took Lieut. Dacre for a flight. Lieut. Joseph passed the tests for the first part of his certificate.

Jullerot, on No. 43, opened proceedings on Saturday to ascertain conditions. Lieut. Joseph passed another part of his tests. Mr. Smith Barry also passed the first part of the tests for his certificate, both being observed by Baron Roenne. Busted took Lieut. Dacre for a flight. Hotchkiss also took Lieut. Burney for a fine flight, experiencing the sensation of being completely cut off from the earth by the clouds. Lieut. Cross made one solo; Lieut. Dacre went for his first solo, and showed signs of having made very rapid progress, his tuition flights being under the half-dozen. Pixton made a cross-country flight with Lieut. Burney, Jullerot taking Lieut. Freeman. Prier, on the two-seater monoplane, took Lieuts. Cross and Joseph and Hotchkiss for flights. Then Jullerot on No. 43 and Busted on No. 7 made solos, describing some very sharp "figure eights."

In the evening Pixton started with Lieut. Burney, and, after alighting for a slight adjustment, started off again for a long cross-country flight.



and eventually he had to land again at Alperston, about five miles short of his destination. This little bit of the journey was completed the following morning. The fog was troublesome throughout the trip, and although he passed not very high above the Tower Bridge, Mr. Hamel said he found that he could scarcely see St. Paul's.

#### Mr. Cody Wins another Michelin Cup.

MR. CODY is an easy winner of the British Empire Michelin Cup No. 2, as his was the only successful attempt, the other competitors having left the matter too late. Several had intended making an attempt on Saturday, but the bad weather frustrated them, and so when the competition closed at sunset on Saturday Mr. Cody was the only one who had covered the 125-mile cross-country course stipulated in the regulations. It will be remembered he flew from Laffan's Plain to Andover, Hendon, Brooklands and back to Laffan's Plain in 3 hrs. 7½ mins. on Sept. 11th.

## The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

### Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 17th inst., when there were present:—Mr. R. W. Wallace, K.C., in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Prof. A. K. Huntington, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. Mervyn O'Gorman, Mr. C. F. Pollock, and Harold E. Perrin, Secretary.

**Aviators' Certificates.**—The following aviators' certificates were granted:—

- 146. Lionel Seymour Metford (Blériot, Hendon).
- 147. William B. R. Moorhouse (Blériot, Huntingdon).
- 148. Zee Yee Lee (Bristol, Salisbury).

### Flights by G. W. Hamel and W. B. R. Moorhouse.

Letters of explanation regarding their recent flights were received from G. W. Hamel and W. B. R. Moorhouse.

### British Empire Michelin Cup (No. 2).

The competition for this year's prize of £400 closed on the 15th inst. Mr. S. F. Cody was the only competitor who made the cross-country circuit of 125 miles in accordance with the rules. The Committee, after examining the Observer's Reports and Certificates relating to the aeroplane, unanimously awarded the prize of £400 and trophy offered by the Michelin Tyre Co. to Mr. S. F. Cody.

Mr. S. F. Cody made three attempts, and his successful flight took place on September 11th last, over the following circuit:—

Laffan's Plain, Andover, Reading, Hendon and Brooklands.  
Time: 3 hours 6 minutes 30 seconds.

The following are the specifications relating to the aeroplane used by Mr. Cody:—

*Cody biplane.*—Motor, 60-h.p. Green; carburettor, Zenith; magneto, British Bosch; sparking-plugs, Pyramid; fabric, pegamoid; propeller, British Chauvière.

The competition for 1912 is now under consideration and will be announced at an early date. The prize will be £600 with a trophy attached, to be retained by the winner.

### European Circuit.

The prizes won in the English section of the European Circuit are as follows:—

### The "Standard" Newspapers, Ltd., £2,500—

	£	s.	d.		£	s.	d.
A. Beaumont	1,111	2	2	L. Gibert	138	17	9
R. Garros	416	13	4	E. Renaux	111	2	3
R. Vidart	277	15	7	F. Barra	111	2	3
J. Vedrines	194	8	11				
A. Kimmerling	138	17	9	Total	2,500	0	0

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## PROGRESS OF FLIGHT ABOUT THE COUNTRY.

### MODEL CLUBS.

#### Bath and Somerset Aero Club (11, ELM PLACE, BATH).

MR. W. ROWLAND DING presided over the inaugural meeting of this club, held at the Church Institute, Bath, on Friday, the 13th inst. Mr. Ding ably explained the objects of the club to a splendid gathering of really keenly interested gentlemen, and rules which had been previously prepared were, with slight amendments, unanimously adopted, the annual subscription for ordinary members being fixed at 2s. 6d., and honorary members and vice-presidents at 5s. It was decided to ask Mr. Ernest Pitman to become president. Mr. Ding promised to become a vice-president, and it is hoped to induce several influential local men to act in a similar capacity. Mr. S. H. Baker was unanimously elected hon. sec., and Mr. G. E. Powell hon. treasurer. A number of models were exhibited, including a large Ding-Sayer machine by Mr. Ding, and a very good model of a Valkyrie machine made by a member of the club.

A flying meeting will be held under the auspices of the club on Saturday, October 21st (weather permitting), commencing at 3 p.m., on the Lansdown racecourse, at which Mr. Ding has promised to get out several models, including a 6 ft. 6 in. model.

The hon. sec. will be glad to hear of any interested who would like to join the club.

#### Blackheath Aero Club (5, LIMESFORD ROAD, NUNHEAD, S.E.).

The club held two meetings last week-end, the first of which was marred by the ground mist which prevailed during the day.

### The Brighton-Shoreham Aerodrome, £400—

	£	s.	d.		£	s.	d.
J. Vedrines	166	13	4	M. Tabuteau	16	13	4
R. Vidart	62	10	0	L. Gibert	16	13	4
A. Kimmerling	41	13	4	F. Barra	12	10	0
A. Beaumont	29	3	4	E. Renaux	12	10	0
J. Valentine	20	16	8				
R. Garros	20	16	8	Total	400	0	0

The Royal Aero Club is now arranging the payment of these prizes. The distribution was delayed owing to a protest made by M. Tabuteau, which he has now withdrawn.

### British Empire Michelin Cup, £500.

Intending competitors are again reminded that the competition for this year closes on October 31st.

The minimum distance to be covered in order to qualify for this prize is 250 miles.

This prize can be competed for on any recognised flying ground. Entries must be sent to the Royal Aero Club, 166, Piccadilly, W., from whom full rules can be obtained.

The Brighton-Shoreham Aerodrome has deposited with the Royal Aero Club the sum of £50 to be awarded to the competitor who makes the longest flight (not being less than 250 miles) in the above competition at the Brighton-Shoreham Aerodrome.

### Membership of the Royal Aero Club.

The membership of the Royal Aero Club is being added to each week, and a large number of new members have been elected during the year. The Committee, however, hopes that all members will use their best influence in extending the membership. The subscription of those members elected between now and the end of the year will cover the period ending December 31st, 1912.

### Flights on Sundays.

A letter has been received from the Home Office, thanking the Club for its action in appealing to aviators to refrain from making flights over or near churches on Sundays.

### F.A.I. Conference.

The Conference fixed to take place in Rome on November 1st has now been postponed till the end of November.

### Late Hon. C. S. Rolls and Cecil S. Grace.

Mr. C. G. Grunhold has contributed £1 1s. towards the stained-glass window now being erected in the church at Eastchurch.

HAROLD E. PERRIN,  
Secretary.

166, Piccadilly.

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The outstanding feature this week has undoubtedly been Mr. Dollittle's experiments with a twin tractor-screw monoplane of original design—several very cute ideas being embodied therein. At the second meeting several members brought monoplanes specially designed to fly half-a-mile, but unfortunately these resolutely refused to come up to their constructors' expectations, although quite respectable flights were made with them. The club was honoured with a visit from an enthusiastic model constructor of Reading, Berks, and we take this opportunity of extending an invitation to any model makers who are visiting the neighbourhood to come to the B. Ae. C.'s Flying Grounds and witness the flights.

The next meeting will be held at Kidbrooke to-day, October 21st, at 3 p.m., and on Saturday, October 28th at 3 p.m., there will be a "Distance" competition, when substantial prizes (1st and 2nd) will be offered by Mr. Rippon, senior. Entries should reach the hon. secretary on or before October 27th. The early morning experiments will take place as usual at the Lee Aerodrome.

### Liverpool Model Aero Club (39, BROOK ROAD, BOOTLE).

A MEETING was held on Saturday on the Waterloo shore, when some good exhibition flights were made for the benefit of the few spectators. Several members are close on the completion of their certificate tests. The shore has not been found an ideal flying place, in spite of the great space, as the sand mixes freely with the



lubricated rubber, and it is also not easy to chase the models over the sand. A diversion was created by a glimpse of Mr. Hardman rolling on Melly's Biériot. He was fast in the mud for a time, but got out, and flew back again.

Next meeting will be at the club ground, Lord's Tar Works, Hawthorne Road, to-day (Saturday) at 3 p.m. Will members meet at 39, Brook Road.

#### Manchester Model AeC. (40, BIGNOR STREET, CHEETHAM).

THE fifth weekly flying meeting inaugurated by the club was a great success. Although the day was rather misty a large crowd collected at the aerodrome, and they were well rewarded by the display of model flying. About a dozen members brought models and some really excellent flights were made, the record flight for the afternoon being 1,185 ft. and the record for duration 48 secs. Much amusement was caused by a model which finished its flight in close proximity to a cow which was grazing in the field. The animal was evidently curious at the intrusion of the model, for it was seen to turn it over and lick the propellers. Whether it was the taste of the varnish or the rubber lubricant which tickled its palate one cannot say. However, no damage was done. Another model gained notoriety by completely breaking itself into fragments in mid-air, the broken pieces scattering the spectators in all directions, much to their amusement. Yet another model flew out of the aerodrome and landed upon a light railway track. An engine which was passing at the time was stopped by the interested driver, thus allowing the model to be captured without injury. Altogether an excellent afternoon was spent, and the enthusiasm of the spectators was most gratifying to the promoters. The sixth weekly meeting will take place at the Trafford Aerodrome, near the "Hives," at 2.30 p.m., October 21st, when records will be attached. Would intending members kindly write to the hon. sec., Mr. Kenmure Kinna, at the above address.

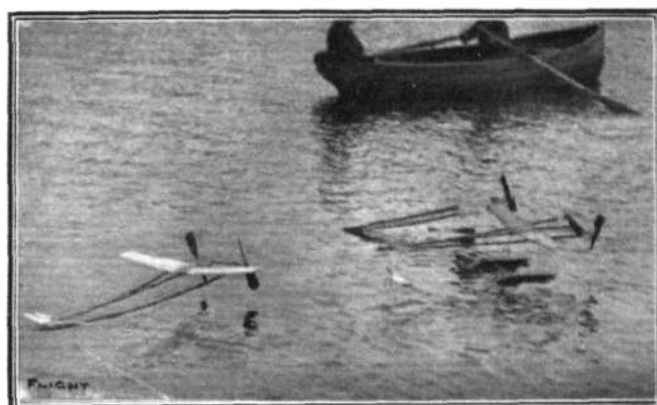
#### Palmer's Green and District Model Aero Club.

THE above club held its inaugural meeting on Saturday, Oct. 14th, at Powys Lane, Palmer's Green. The weather conditions were almost perfect, and in the Distance and Duration Competition some good flying was witnessed. The honours of the day fell to Mr. E. R. Brown, who gained first place with his 3 ft. model, 665 ft. in 42½ secs., and second place with his 1 oz. machine which flew rapidly for 31½ secs., and, after circling, alighted 506 ft. from the starting flag. It should be mentioned that the winning flight terminated when at its best in an oak tree, whence rescuing operations were conducted by means of a ladder and a long pole. The third place for distance was secured by Mr. Reed with a fast flight of 303 ft., while Mr. A. Rogers' "four-footer" with 29½ secs. to its credit, gained the corresponding position for duration. The latter, however, provided the only smash of the afternoon, following in the wake of two other "single stickers" we have known.

All persons interested in model flying are earnestly requested to communicate with R. L. Rogers, hon. sec. (*pro tem.*), 15, Moffat Road, Palmer's Green, N.

#### St. Mary's Model Ae.C. (THE VICARAGE, KINGSTON, PORTSMOUTH)

SATURDAY last was an ideal day for flying, of which the club took advantage, and turned out in force. Some grand flying was witnessed by both long and small-surfaced models, the great majority of the flights being 600 ft. and over, whilst Mr. Eborne made a speciality of high flying, reaching 40 and 50 ft. Much tree-climbing



Some of the model hydro-aeroplanes of the Scottish Aeronautical Society Model Aero Club on the boating loch, Glasgow, at last Saturday's meeting.

had to be indulged in, and it was evident that the present ground is not quite large enough. Could anyone please let the secretary know what is the record for the Portsmouth district, as the St. Mary's Club is 660 ft. at present.

#### Scottish Ae.S. (Model Aero Club) (6, McLELLAN ST., GOVAN).

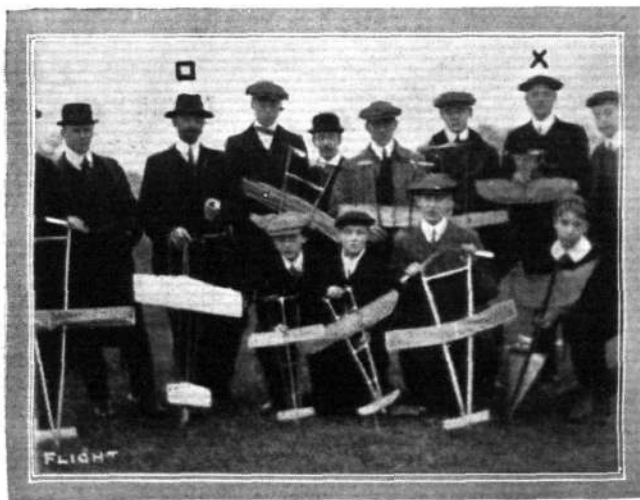
A MEETING for hydro-aeroplanes was held last Saturday at the Boating Loch, Great Western Road, Glasgow, when seven models lined up on the water. The trials were interesting, and sometimes humorous to watch, but none of the models succeeded in rising from the surface. After this some ordinary flying over the water was indulged in. Mr. Gordon's model flew right across the loch, striking the trees on the other side. Mr. Balden's model made many brilliant flights, which were all the more noteworthy as his model was soaked with previous duckings. The first biplane of the season (Mr. Mills') made its appearance, and flew exceedingly well. A flying meeting for models will be held to-day (Saturday) at Barrhead aerodrome, when attempts will be made on the duration record. The club's prospects are very bright, and as the new season is just commencing new members are urgently wanted. The hon. secretary, Mr. Wm. Foster, Rochelle, Limeside Avenue, Rutherglen, will be pleased to give all particulars to intending members.

#### Stony Stratford and District Model Aero Club.

A PUBLIC meeting has been called for October 26th for the formation and founding of the proposed club under the title of the Stony Stratford and District Kite and Model Aeroplane Club. The meeting will commence at 8 p.m., and it is hoped to arrange an exhibition of models and accessories. The Secretary (Lancaster Cottage, Old Stratford, Stony Stratford, Bucks) will welcome the loan of machines from any of our readers.

#### Yorkshire Ae.C. (Model Section) (5A, HULLAND ST., LEEDS).

THE Leeds Model Aeroplane Club held a general meeting on Saturday last, 14th inst., in the Drill Hall, Carlton Hill Barracks, Leeds. The club was reorganized, and will now be known as the Model Section of the Yorkshire Aero Club. A letter was read from the committee of the Y.Ae.C., who were represented by Mr. S. W. Fitzgerald. It included a suggestion to the effect that in order they may keep in close touch with model matters, the President of the Model Section should be a member of their committee. This was approved by the members present, and Mr. S. W. Fitzgerald was unanimously elected as the ideal person to occupy the position. It was next decided that Mr. Tom Walker should stand as secretary and treasurer, for it was the general opinion that the way in which he had organized and managed the late club was fit proof of his capabilities. The committee will comprise Messrs. Thornton, Beckett and Hill. Members of the Model Section will be associates of the Y.Ae.C., having all the privileges of members, with the single exception that they will not be allowed to vote on matters pertaining to the governing of the Y.Ae.C. They can attend all meetings, lectures, and flying meetings, and partake of any privilege which may at any time be obtained by members of the Y.Ae.C. The annual subscription is fixed at 2s. 6d., of which 6d. is to be payable to the Y.Ae.C. as associate's fee. All persons in Leeds and district can become members, ladies included, on conditions that they are workers, not lookers-on. Flying meetings will be held, weather permitting, every Saturday afternoon, from 2 o'clock, on Carlton Hill Barrack Ground, off Woodhouse Lane. The committee of the Y.Ae.C. intend putting up a series of money and other prizes for competition amongst model flyers, on conditions to be settled later. All communications should be addressed to the hon. sec., as above.



SHEFFIELD MODEL AERO CLUB MEETING LAST SATURDAY.—The winner of the distance prize is indicated by a X, and Mr. E. E. Noble is marked with a □.

## BRITISH NOTES OF THE WEEK.

### The New Short Biplane.

TESTING the new Short twin-engine biplane a few days ago, Mr. Frank McClean flew it from Eastchurch over Capel Hill to Leysdown, and along the Swale to King's Ferry, and skirting Queenborough and Sheerness, returned to Eastchurch. There was a stiff breeze, but with the new control system the minor air currents scarcely affected the machine. A similar biplane is now being built

from France with a view to purchase by the Army authorities. During a flight at Farnborough it was piloted by one of the French flyers from the works and carried Mr. De Havilland as passenger. The trials were ended by a *vol plané* from a height of 2,500 ft. While the Breguet was in the air Mr. Cody flew over from Laffan's Plain on his machine, which appeared to travel a little faster than the Breguet.



Another "Aerial Post" is being run unofficially from Freshfield to Southport. Through this channel we have received the picture postcard above of Mr. Higginbotham's biplane.

by Messrs. Short Brothers, and they will shortly commence another biplane embodying one or two new features, and fitted with two 100-h.p. engines driving four propellers.

### The Barnwell Monoplane Out Again.

ON the 13th inst., Mr. Barnwell had his monoplane out again at Blair Drummond, and made a successful flight. It is to be hoped that the efforts of this plucky and persevering Scottish flyer will now meet with the success they merit.

### A Breguet at Aldershot.

ON Thursday of last week, considerable interest was taken in the appearance of a new-comer on the Army flying ground at Aldershot. This was the Breguet biplane, which had been brought

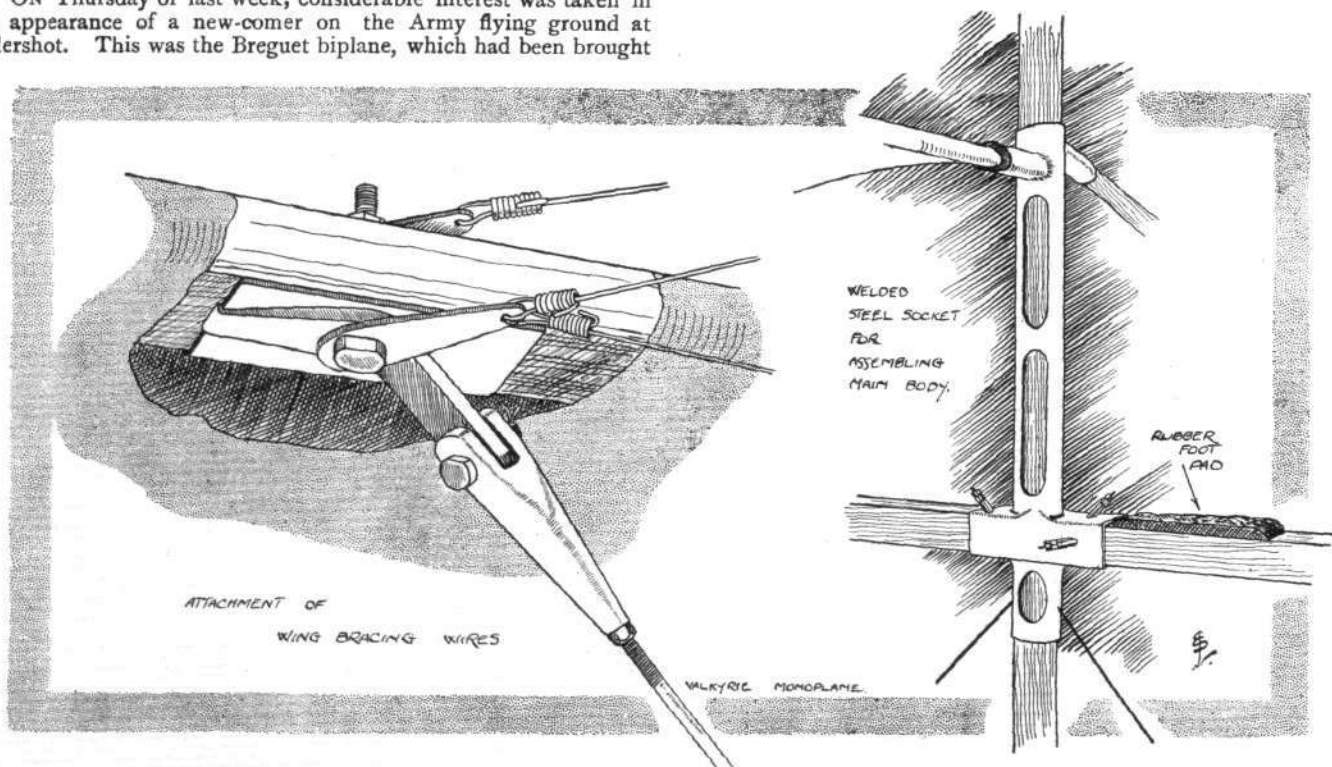
On Saturday the machine underwent a duration test, being taken by its French pilot for an hour's flight, during which an altitude of over 1,000 ft. was reached, while subsequently it was tested for speed over a course laid out on Laffan's Plain.

### Shall it be "Air-plane"?

WRITING from Cambridge, the Rev. Professor Skeat suggests that as aeroplane is but a clumsy compound and means "air-plane," the machine might just as well be called by that name. He adds that it is quite idiomatic. The opinion of this learned Professor of Anglo-Saxon always commands respect and attention, but we fear "aeroplane" is too firmly established now to be ousted.

### A Guide for Patentees.

A NEW edition—the fifth—having been called for, Messrs. Withers and Spooner of 323, High Holborn, have taken advantage of the opportunity to thoroughly revise and bring up to date the general information regarding patents and patenting. The new edition contains much fuller details regarding foreign patents and trade marks, and as it gives all essential information in a concise and clear form the little book should be valuable to all who are interested in patents, whether as inventors or otherwise.



Constructional details of the new Valkyrie racer equipped with a Gnome motor of 50-h.p., to which we referred last week. One important innovation is the fact that the use of aluminium has been discarded, steel being used in its place.



**A Blériot at Rhyl.**

STARTING from Foryd Farm, Rhyl, on his Blériot monoplane Mr. Vivian Hewitt on the 12th inst. made a good circular flight in the district.

**Model Aeroplanes at Westminster.**

AT the *Model Engineer* Exhibition, which has been open during the past week at the Horticultural Hall, Westminster, there was quite a fair sprinkling of model aeroplanes and appliances connected with aviation. The Aero Models Association had a special exhibit, among which was a fine model of Grahame-White's "Baby" biplane, driven by a compressed-air engine, made by Mr. J. K. Simon, and a very neat model aeroplane-power unit, in which the blades of the propeller were fastened to the cylinder heads. There was also a fine show of models by Mr. Bragg-Smith, while another attractive exhibit was that of the Mann monoplane, including a new type with the large plane leading. A fitting which aroused a good deal of attention was the very ingenious "Mann" winder, arranged for winding up two propellers at the same time.

**Bargains in Aeroplanes.**

THOSE who wish to get a real aeroplane bargain should write for further particulars of the special offer of Messrs. A. V. Roe and Co. which will be found in our advertisement column. They are offering to supply a round dozen of Avro biplanes fitted with 35 h.p. Green engines at 30 per cent. off the list price. It should not be forgotten that several of the foremost flyers in England at

the present time learnt the art of aerial navigation on Avro machines.

**Catalogue of Model Materials.**

ALTHOUGH it is stated that the list does not contain all the goods stocked, the latest catalogue of Messrs. Melcombe, Station Road, Harpenden, Herts, is a very complete one, and model makers would do well to keep a copy of this No. 7 list by them. It seems to embrace particulars of everything necessary for the construction of model machines, and at the end are some very useful notes on the selection of materials. A copy will be sent to any of our readers on receipt of three penny stamps.

**Biplane, Not Monoplane.**

THE penalty of a "slip" in our editorial columns is rather severe. Fully a hundred and fifty postcards and letters have reached us pointing out the printer's error under our frontispiece last week, in which the Bristol *monoplane* was referred to instead of the Bristol *biplane*. We thank all our friends for this little helpful correction, although we hardly think that anybody could have been misled by the inscription, having regard to the picture to which it referred.

**Leonardo da Vinci's Achievements.**

IN his presidential address to the Royal Photographic Society last week, Lord Redesdale dwelt at some length on the aeronautical achievements of Leonardo da Vinci, the great Italian mathematician, and said that all that da Vinci needed to perfect his thirty years' work on the problem of mechanical flight was a motor.

✱ ✱ ✱ ✱

## AIR EDDIES.

M. SALMET, an old pupil of the Blériot school at Hendon, has now been appointed as instructor to that school, and it is assured that he will do as much to uphold the honour of the firm as did his famous predecessor, Pierre Prier.

By the way, it is rather interesting to note that Salmét had only flown his Gnome-Blériot on three previous occasions before he made that fine performance in a thirty-mile-an-hour wind on Aerial Mail day at Hendon. He intends to attempt something big in the way of cross-country flying in the near future, and, by way of training, has recently made two trips round Wembley, on both occasions in an uncomfortably dense fog.

Calling in to see Hubert at St. Mary's Hospital last Tuesday, I found him looking particularly cheery considering the length and tedious nature of his enforced imprisonment.

His right leg has knit satisfactorily and has been taken out of splints. Altogether his condition has so improved that he hopes to get clear of the hospital and back to his home at Cherbourg within a month. It is unlikely that he will be able to walk by that time, but, at any rate, he will be strong and fit enough to undertake the journey and place himself under the care of his father, who is a member of the medical profession.

It is stated in America that Grahame-White is going to fly the Martin biplane, equipped with a Gnome motor of 100-h.p., which is illustrated in another part of this issue, and that he intends, on this machine, to make an attempt on the world's speed record.

James V. Martin, a former pupil of Mr. Grahame-White, who is responsible for the design and construction of this biplane, makes no attempt to hide the fact that most of the ideas embodied in his machine were secured from that exceptionally efficient biplane—the Avro.

The Flanders monoplane, which has earned for itself a very enviable reputation down Brooklands way, has retired to its hangar pending preparations for an early attempt on the Michelin prize for duration. For three days preceding the closing of the cross-country Michelin competition, Ronald Kemp had been patiently awaiting an opportunity of putting up a good performance in this connection, but the weather conditions put cross-country work out of the question. The Flanders should make its reappearance in a few days' time.

In a letter from Lewis Turner, who will be remembered as having been engaged to carry out trials on a new biplane in Russia, I learn that he finds himself in the position of chief pilot to the largest aeronautical firm in that country, and the only one that has been favoured with Imperial sanction—the Kennedy Aviation Co.

As for the machine—a biplane—Turner expresses the opinion that it is a really sound proposition, one far superior in design and finish to any machine at home. I hope to be able to furnish photographs and particulars of this interesting biplane at an early date.

To the British and Colonial Aeroplane Co. belongs the credit of being the first to qualify a Chinaman for his aviator's certificate. Their pupil, Mr. Z. Y. Lee, sent by the Chinese Government to study aviation at that firm's Salisbury Plain school, made the necessary flights for his *brevet* on Thursday of last week.

Grahame-White's Hendon works, installed under the able supervision of Mr. Leonard Williamson, are assuming a very business-like aspect, and should be in full working swing by the time these lines appear in print. The first hangar—there are nine in the block—has been partitioned down the centre, and one half, equipped with power-driven tools, comprising a lathe, drilling machines, power back saw, etc., will constitute the engineer's shop, while the other half will be used as the stores.

The second shed is the wood-working shop, and here will be manufactured struts, ribs, skids, and all the wooden parts of the aeroplane. In this shop a planer, a band saw, and a spindle machine, all power-driven from a gas engine in an adjoining shed, have been installed. The surfacing of the planes and general trimming will be carried on in a spacious gallery erected at the front of the shop.

Erection of the separate components such as *cellules*, engine-beds and landing chassis will be undertaken in the third shed, and from thence these parts will proceed to the fourth and fifth hangars, where the complete machines will be wired and assembled. The remaining four will be used to accommodate the school machines.

Although Lieut. Parke is helping along things by acting as instructor at the Grahame-White school, his relations with that firm are, it should be noted, purely of a friendly nature, as, being on active Naval service, he can only devote his leisure to the sport.

The Valkyrie school have a really notable pupil in Capt. Loraine, for on Saturday last, after only four hours' previous experience on the machine, he was making splendid flights with both hands off the controls and above his head. Capt. Loraine should have secured his certificate on that day, but was apparently so wrapt up in the pleasure of flying that he forgot all about it.

I am glad to see Ridley-Prentice reinstated at the Aeronautical Syndicate after his recent accident. That he has lost little of his nerve is evident from the fact that he made several flights on the Valkyrie on Saturday last.

"OISEAU BLEU."

# FOREIGN AVIATION NEWS.



The late Capt. Englehard, who was recently killed at Iohannisthal, looking over his German-Wright machine before making a flight at the German aerodrome.

## Re-opening of Pau Schools.

WITH the return of winter the flying schools are turning their eyes to the South of France again and the Aerodrome of the

Compagnie Aerienne commenced its winter season on the 10th inst., when de Ridder gave an extraordinary display of various aerial tricks on a Voisin biplane.

## Douzy to Rheims in Quick Time.

USING one of the new 50-h.p. Sommer monoplanes, and carrying a load of 180 kilogs., Bathiat flew over from the Sommer headquarters at Douzy to Rheims on the 11th inst. covering the 65 kiloms. in 40 mins. He repeated the journey on the following day when, however, he was a little slower.

## Fast Flying on a Morane.

LEAVING Castillonnes on the 11th inst., Brindejone des Moulinais, on his Borel-Morane monoplane, flew over to Grissoles, a distance of 135 kiloms., in 1 hr. 22 mins. On the 13th inst. he continued his journey to the Isle en Dodon, doing the distance of 105 kiloms. in 58 mins., despite the wind and rain.

## At the Maurice Farman School.

AMONG visitors to the Maurice Farman School at Buc, on the 11th inst., was M. Nedin, a delegate from the Turkish Government. During the afternoon Lieut. de Coville passed the second test for his superior *brevet*, and on the following day Maurice Farman went over to Etampes to bring back one of the record-breaking machines, and on the return journey, by way of the air, he was accompanied by his brother Dick.

## Good Flying at the Hanriot School.

ON the 12th inst., Marcel Hanriot, on one of the biplanes, flew from Rheims to Mourmelon and back without stopping, in 58 minutes. Hanriot *père* was out testing a new machine fitted with a 100-h.p. Clerget engine.

## More Nieuports for French Army.

ON the 13th inst., trial flights were carried at Mourmelon, before a deputation of military officers, of four Nieuport monoplanes intended for use in the French Army. The total flying time of the four machines was 9 hours. Two of them were fitted with 2-cyl. 28-h.p. engines, and two with 50-h.p. Gnome motors. The altitude test of rising to 500 metres was made in times ranging from 7 to 9 minutes.



Henri Bregi's Breguet machine in Morocco.



**An Adventure in the Fog.**

WHILE flying in the neighbourhood of Issy Lieut. Battini and a sapper on Sunday last met with an accident which might have had much more serious consequences than the few bruises which they sustained. When coming down on account of the fog which overtook them the pilot failed to notice some telegraph wires which pitched the machine with a crash on to the railway lines.

**A Marine Voisin-Canard.**

As a result of the experience gained with the original Voisin-Canard machines, one has been specially built for French naval use. There is very little difference between this and the original machines, except that it has three floats instead of four, and the wheels of the chassis are so arranged as to be raised above the floats when the machine is being used on the water. Just previous to his going to Rheims for the military competition, Colliex had the machine out at Billancourt, and made one or two good flights over the Seine.

**Betting by Aeroplane.**

LEGAGNEUX and Martinet have given many curious demonstrations of the utility of the aeroplane in the business and pleasure of daily life, and last Friday they appeared over a racecourse at Puteois, near Compaigne, where a meeting was in progress, and dropped an envelope containing two bets. Let us hope they were well rewarded by their choice. It is interesting to speculate whether a British Magistrate will ever have to decide whether an aeroplane is a "place" within the meaning of the Act.

**Honours for French Military Aviators.**

FOLLOWING on the decorations which have already been awarded to the aviators who took part in the recent French Manœuvres, an official announcement has been made of the award of the Cross of the Chevalier of the Legion of Honour to Captains Bares, Bellenger, Eteve, de Chaunac Lanza, and Lieuts. De Rose, Lucca and Hennequin.

**Landing in the Middle of Pau.**

ON Sunday last de Ridder on his Voisin biplane succeeded in doing what several pilots have unsuccessfully attempted, by landing in the middle of the town of Pau. He started from No. 3 aerodrome and a few minutes after alighted in front of the Hauteplante Barracks, where he was greeted by General Isnard. It being practically impossible to start from so restricted a place, the aeroplane was afterwards taken back to its headquarters on a lorry.

**Passenger Carrying by Sommer.**

ON Monday Sommer made a very fine performance by carrying four passengers, including Col. Estienne, Senator Raymond, Madame Geoffroy and Lieut. Pierrat for a trip from Rheims to Vitry and back.

**Two Issy-Orleans Flights.**

IN a flight for the Prix des Escales, on Monday, Duval, on a Caudron biplane, left Issy at 12.30, and landed at the Groues aerodrome, at Orleans, at 1.45. Later in the afternoon, Hanouille, on a Blériot-Anzani, flew over the same course in 1 hr. 50 mins. in an attempt for the Anzani "Jeton d'Or" competition.

**A New Aerodrome at Orleans.**

NOT content with the two aerodromes at Groues and Cercottes, the inhabitants of Orleans have decided to lay out a special aero-

drome of 110 hectares, with hangars, &c., and about half of this place will be offered to the Minister of War for military aviation. For the establishment of this great flying ground the city of Orleans is giving 200,000 francs, while the Conseil Générale has given a further 100,000 francs. By this means it is hoped to make Orleans an important aviation centre both from a military and a civil point of view.

**Vedrine's Friendly Act.**

BEFORE his accident at Rheims "Beaumont" had arranged to carry out some exhibition flights at Marseilles in order to aid the Relief Fund in connection with the "Liberte" disaster. On hearing of the accident to his friend, Vedrine at once offered unconditionally to take his place.

**Lieut. Bier's Passenger Record.**

SOME doubt appears to exist as to whether Lieut. Bier's height record with two passengers can be accepted by the Austrian Club, as it seems one of the passengers did not weigh 75 kilogs., which most National Clubs consider the minimum weight for record work. The question of the minimum weight of passengers is one which is to be considered by the F.I.A. at its next meeting.

**Austrian-Daimler Aero Engines.**

THE fast flight of Marquis Gavotti on an Etrich monoplane on the 20th ult., from Bologna to Venice and Rimini and back, a distance of 420 kiloms., so impressed the Italian War Office with the good qualities of the Austrian-Daimler engine that they have ordered several. Others have been ordered by the Russian, German, and Austrian military authorities, and Mr. S. F. Cody is having a 6-cyl. engine of this make fitted to his new biplane.

**Dutch Flyers Honoured.**

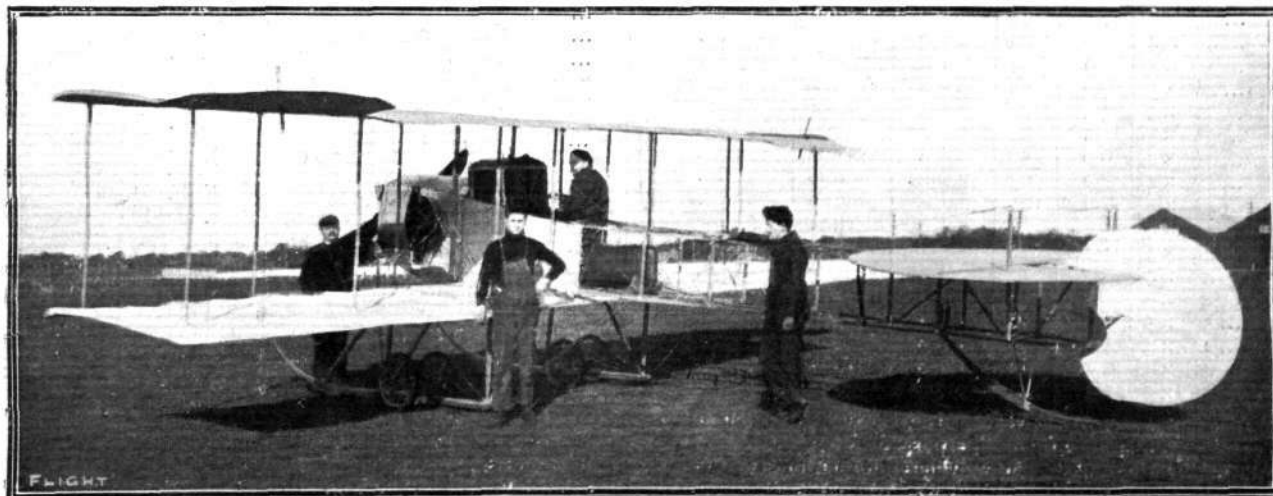
FOR their services in connection with the manœuvres last month, the Dutch flyers Van Meel, K. H. Bakker, J. Labourchere, and H. Poorten have been decorated by the Dutch Government with the Royal Order of Orange Nassau. The last two are second-lieutenants in the reserves.

**The Swiss Meeting.**

THE opening of the meeting at Berne last Saturday was marred by a bad accident, in which the aviator Hans Schmidt lost his life. He had made a fine flight of 31 mins., when the machine was seen to oscillate and then suddenly dive to the ground from a height of 50 metres. The wreckage burst into flames, and before anything could be done the pilot was burnt to death. Flying was immediately suspended for the day. On the following day some good flying was put in by Durafaur (Dufaux), Grandjean (Blériot), Taddeoli (Morane), and Wyss (Blériot), but on Monday the wind prevented any of the machines being seen in the air. It was also decided to abandon the proposed circuit from Berne to Bienne, Avenches, Neuchatel, Geneva.

**Mr. Ogilvie in America.**

VERY few details are to hand as to the experiments which are being carried out at the present time at the Devilkill Hills, North Carolina, by the Wright Bros., but at the beginning of the week Mr. Alec Ogilvie was experimenting with Orville Wright with a new glider, and in one of the glides it is said he rose 30 feet above the point of departure. In the afternoon Orville Wright was practising, but his best effort is said to have been 200 feet in length.



J. V. Martin, who graduated in aviation at the Grahame-White School at Hendon, at the helm of the new 100-h.p. Gnome-engined Martin biplane, which the Queen Aeroplane Co., of New York, have constructed to his designs. On this machine Martin himself has put up a speed of 72 miles per hour flying across country.

**TABLE OF AMERICAN AERONAUTIC MOTORS.**  
 Complete Specifications of the Motors of Thirty-four Manufacturers.  
 Compiled by E. L. JONES and S. Y. BEACH.  
 (From the *Scientific American*.)

Name.	Bore and stroke.	Manufacturers' Rating.	A. L. A. M. Rating.	No. of Cylinders.	Cycle.	Arrangement of Cylinders.	Intake Valve.	Compression.	Carburettor.	Cooling.	Oiling.	Ignition.	Weight.
								lbs.					lbs.
Aircraft ...	4½ × 5	40	32	4	4	Vertical	M.	80	Choice	El Arco	F. F. and Sp.	Bosch	125
Aircraft ...	4½ × 5	80	65	8	4	"V"	M.	80	Choice	El Arco	F. F. and Sp.	Bosch	210
Aircraft ...	4½ × 5	160	130	16	4	"V"	M.	80	Choice	El Arco	F. F. and Sp.	Bosch	325
*†A.-M. ...	3½ × 3½	35	34	7	4	Radial	M.	85	Schebler	Air	F. F.	Mea	125
*†A.-M. ...	2½ × 2½	35	29	6	2	Radial	None	80	Own	Air	F. F.	Mea	90
Ashmussen ...	3½ × 3½	25	22	4	4	Horizont.	A.	75	Indiv. Ash.	Air	F. F.	Mag.	124
*Avis ...	5½ × 5	30	34	2	2	Opposed	None	75	Schebler	Air	Oil in gas		98
Boland ...	4 × 4	60	51	2	8	"V"	A.	72	Mayer	Water	F.	B. or Mea	262
Boulevard ...	4½ × 4½	30	32	4	4	Vertical	M.	90	Choice	El Arco	F. F. and Sp.	Bosch	150
Boulevard ...	4½ × 4½	60	64	8	4	"V"	M.	90	Choice	El Arco	F. F. and Sp.	Bosch	255
Broderick ...	5 × 5	40	40	2	2	Vertical	A.	75	Choice	Water	F. F. and Sp.	Bosch	150
Brott ...	4½ × 4½	45	32	4	4	"V"	M.	70		Water	F. F.	Mea	175
Call ...	6 × 5½	50	29	2	4	Opposed	M.	96	Schebler	El Arco	F. F.	Choice	185
Call ...	6 × 5½	100	58	4	4	Opposed	M.	96	Schebler	El Arco	F. F. and Sp.	Choice	325
Curtiss ...	3¾ × 4	25	23	4	4	Vertical	M.	...	Schebler	El Arco	F. F. and Sp.	Bosch	130
Curtiss ...	4 × 4	50	51	8	4	"V"	M.	...	Schebler	El Arco	F. F.	Bosch	250
De Chesne ...	5 × 5	50	40	4	4	Vertical	M.	74	Schebler	El Arco	F. F. and Sp.	A. K.	280
Detroit Aero ...	5 × 5	20-30	24	2	4	Opposed	M.	90	Schebler	Air	F. F.	Bosch	149
Elbridge ...	4 × 4½	40	55	4	2	Vertical	None	60	G. & A.	El Arco	Oil in gas	Bosch	198
Elbridge ...	4 × 4½	60	84	6	2	Vertical	None	60	G. & A.	El Arco	Oil in gas	Bosch	...
Emerson ...	5 × 5	40	40	4	4	Vertical	A. and M.	...	Schebler	El Arco	Oil in gas	Mea or	...
Emerson ...	5 × 5	60	60	6	4	Vertical	A. and M.	...	Schebler	El Arco	Oil in gas	Atwater-	312
Emerson ...	5 × 5	65	65	4	2	Vertical	None	...	Schebler	El Arco	Oil in gas	Kent	...
Emerson ...	5 × 5	100	98	6	2	Vertical	None	...	Schebler	El Arco	Oil in gas		348
*Farwell ...	6 × 6	80	72	5	4	Radial	M.	...	Owen	Air	Mechanical	Duplex	280
Fox ...	3½ × 3½	24	32	4	2	Vertical	None	...	Schebler	Water	Oil in gas	Bosch	...
Fox ...	3½ × 3½	36	48	6	2	Vertical	None	...	Schebler	Water	Oil in gas	Bosch	...
Fox ...	4½ × 4½	60	59	4	2	Vertical	None	...	Schebler	Water	Oil in gas	Bosch	...
Fox ...	4½ × 4½	90	80	6	2	Vertical	None	...	Schebler	Water	Oil in gas	Bosch	...
*Gyro ...	4½ × 4½	60	50	7	4	Radial	M.	Variable	Schebler	Air	Oil in gas	...	...
Hall-Scott ...	4 × 5	40	51	4	4	Vertical	M.	82	Stromberg	Hall-Scott	F. F. and Sp.	Bosch	150
Hall-Scott ...	4 × 5	80	51	8	4	"V"	M.	82	Stromberg	Hall-Scott	F. F. and Sp.	or	270
Hall-Scott ...	4 × 4	30	26	4	4	Vertical	M.	82	Stromberg	Hall-Scott	F. F. and Sp.	Mea	142
Hall-Scott ...	4 × 4	60	52	8	4	"V"	M.	82	Stromberg	Hall-Scott	F. F. and Sp.		265
H-DeK ...	4½ × 5	30-40	33	4	4	Vertical	A.	72	G. & A.	Water	M. and Sp.	Mea	160
H-DeK ...	5½ × 6	60-80	43	4	4	Vertical	A.	85	G. & A.	Water	M. and Sp.	Mea	255
Indian ...	4 × 4½	60	51	8	4	"V"	M.	...	Indian	Water	F. F.	Bosch	275
*Indian ...	4½ × 4½	50	53	7	4	Radial	M.	...		Air	F. F.	Bosch	...
Kirkham ...	4½ × 4½	50	41	6	4	Vertical	Sliding sleeve	90	Choice	Water	F. F. and Sp.	Simms	235
Kirkham ...	4½ × 4½	55	45	6	4	Vertical	Sliding sleeve	90	Choice	Water	F. F. and Sp.	Simms	205
Leighton ...	5 × 4½	40-50	...	4	2	Vertical	M. and A.	50	Schebler	R. T. Co.	Oil in gas	A.-K., B.	285
*Macomber ...	4½ × 4½	50	50	7	4	Horizont.	M.	Variable	Choice	Air	S. P.	Bosch	240
Maximotor ...	4½ × 4½	30-40	32	4	4	Vertical (en bloc)	A.	65	Schebler	Detroit and El Arco	F. F. and Sp.	Mea	190
Maximotor ...	4½ × 4½	50-60	48	6	4		A.	65	Schebler		F. F. and Sp.	Mea	260
Maximotor ...	5 × 5	40-50	40	4	4		A.	65	Schebler		F. F. and Sp.	Mea	220
Maximotor ...	5 × 5	60-75	60	6	4		A.	65	Schebler		F. F. and Sp.	Mea	300
Metz ...	4 × 4	30	26	4	4	Vertical	M.	...	Own	Water	F. F. and Sp.	Bosch	155
*Metz ...	6½ × 6½	120	126	7	4	Radial	M.	...	Own	Air	Sp.	Bosch	375
*Metz ...	4½ × 4½	58	57	7	4	Radial	M.	...	Own	Air	Sp.	Bosch	180
*Metz ...	3½ × 3½	35	34	7	4	Radial	M.	...	Own	Air	Sp.	Bosch	120
Rinek ...	4 × 4	30	26	4	4	Vertical	M.	...	Schebler	El Arco	F. F.	Bosch	130
Rinek ...	4 × 4	50	51	8	4	"V"	M.	...	Schebler	El Arco	F. F.	Bosch	285
Roberts ...	4½ × 5	50	52	4	2	Vertical	Rotary	75	Kingston	El Arco	Oil in gas	Bosch	190
Roberts ...	4½ × 5	75	79	6	2	Vertical	Rotary	75	Kingston	El Arco	Oil in gas	Bosch	260
*Rotary ...	3½ × 3½	35	34	7	4	Radial	M.	...	Schebler	Air	F. F.	Bosch	140
*Rotary ...	4½ × 4½	50	50	7	4	Radial	M.	...	or	Air	F. F.	or	175
*Rotary ...	4½ × 4½	70	63	7	4	Radial	M.	...	G. & A.	Air	F. F.	Mea	200
*Rotary ...	4½ × 4½	100	101	14	4	Radial	M.	...		Air	F. F.		250
Gray Eagle ...	4½ × 4½	30-40	29	4	4	Vertical	Automatic	50	Schebler	Air	S. F. and S.	Bosch	182
§Smalley ...	4½ × 4½	20-100	26-80	2-6	2	Vertical	None	...	Schebler	Water	Oil in gas	Mea	103-316
*Stenzy ...	4 × 4	25	13	2	4	Tangent	A.	70	Schebler	Air	Oil in gas	Bosch	65
*Stenzy ...	4 × 5	50	13	2	4	Tangent	A.	70	Schebler	Air	Oil in gas	Bosch	80
*Stenzy ...	5 × 5	200	40	4	4	Tangent	A.	70	Schebler	Air	Oil in gas	Bosch	200
Waterman ...	4 × 4	24-30	38	4	2	Vertical	A.	60	Br.-Detroit	Water	Oil in gas	Bosch	190
Whitehead ...	4½ × 4½	30-40	43	4	2	Vertical	A.	90	Schebler	El Arco	Splash	Bosch	130
Wolverine ...	5½ × 5	25-30	24	2	4	Opposed	Mechanical	65	Schebler	Air	Oil in gas	Bosch	160

WEIGHT.—The weight asked for was to cover "all essential parts, including carburettor, ignition system, lubricator, radiator, ready for fuel to start." The figures printed are those given us under this condition, unless otherwise specified in table.

BLANKS.—Dotted lines are used where information has been requested and not supplied.

A. L. A. M. RATING.—The A. L. A. M. formula is bore squared, times the number of cylinders, divided by 2.5. The result times 1½ gives one rating, used above, for 2-cycle engines.

\* Rotating motors. † This is also made in 50-h.p., 70-h.p. and 100-h.p. sizes. ‡ Made also in 50-h.p., 70-h.p., 100-h.p. and 150-h.p. sizes. § The Elbridge Company makes six sizes, as does the General Machinery Company. || Other sizes are 40-h.p. and 60-h.p. The same sizes are also made in 4-cycle engines.



## CORRESPONDENCE.

\* \* The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which have appeared in FLIGHT, would much facilitate ready reference by quoting the number of each letter.

## Naturally Stable Machines.

[1394] Since the publication of my letter and photos in FLIGHT I have had a number of letters on the subject of the "diamond-shaped box plane" from others who have experimented with it, notably from Mr. "Redivalls," who tells me he has taken out a patent in connection with it. I congratulate him.

My object in writing to you now is to call your attention—and possibly that of your readers—to the fact which my correspondents are practically unanimous in emphasizing, viz., that aviators and builders of full-sized machines will not even consider the adoption of this member as a means of obtaining automatic lateral stability, on the ground that it has been tried and proved to be unsafe.

One can only imagine that it is being identified with the "square-ended" or "side curtain" arrangement used on the early Voisins.

But there is all the difference in the world between the action of the square-ended box plane and the point-down box plane, as anyone who tries them will instantly discover.

The monoplane with dihedrally up angle, fitted with a point-down box plane, of suitable size at its centre, and properly balanced longitudinally, will recover an even keel immediately, however much it may have been canted over, even if it should have been entirely capsized.

Moreover, the same effect takes place irrespective of the horizontal speed of the machine. Speed lessens the liability of the machine to cant at all, it is true, but the righting impulse is equally rapid, and equally unfailing, at whatever speed the machine is moving horizontally; the slightest movement having a downward tendency seems to put it into instant operation.

I hold no brief for "Redivalls" or anyone else. I am an amateur experimenter pure and simple. But here is a feature so absolutely startling in its stabilizing effects that it could not fail to convince anyone who actually tried it, or saw it tried, and yet I am told that those most actively interested in aviation have obviously never even taken the trouble to consider wherein this "box plane" differs from the old square-ended "box planes" of the past that are now very rightly voted unsafe—still less to try it for themselves, when they simply could not fail to be convinced.

One feels, as one deeply interested in the new science, how very much is probably being kept hidden by conservative tendencies of this sort.

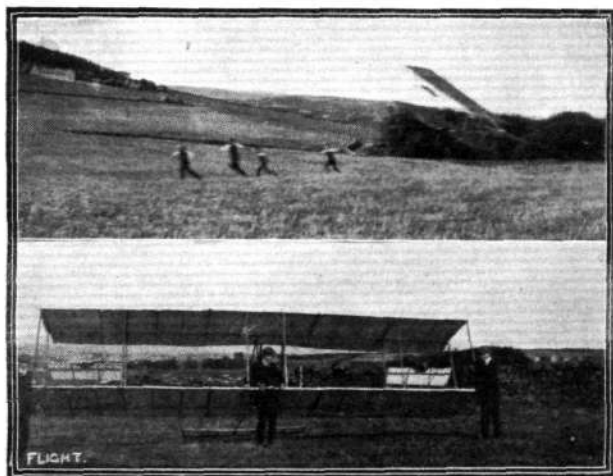
Downham Market.

(REV.) HAROLD KELK.

## Twisting Tail for Steering.

[1395] I wish to thank Mr. Cochrane (1372) for his courteous reply to my query contained in a previous issue of this paper.

The principle involved in my idea is dissimilar to that which he patented in 1902. By very careful and thorough experiments with a model monoplane I have obtained a very efficient tail by which altitude and direction can be governed. The model was launched



The glider which has been built at Aberdeen by Messrs. Anderson and Singer has been making some excellent glides. The photographs were taken after certain alterations had been carried out as a result of experience gained, and with the machine seen in our pictures the most successful glide obtained was about 25 to 30 yards.

so that whilst it was "gliding" or "flying" it would pass several windows opened on one side of a hall. By this means it was subjected to sharp draught at short intervals. It was extremely interesting to note how directly the model felt the draught it veered out of its course by banking, but the tail, by its peculiar movements, adjusted itself and almost immediately brought the model back to the direction in which it was launched.

Lowestoft.

ROJ. F. RICHARDS.

## Long-Distance Flyers Propelled by Elastic.

[1396] I read with much bewildered interest Mr. Mann's letter in these columns regarding the limit of long-distance flyers propelled by elastic. I contend that the results obtained with a 30 in. model provided with 6 strands of elastic need not be less meritorious than one provided with 12 strands of the same elastic, provided of course that the power was properly used. I may say that I have a 36 in. model fitted with 2.8 in. propellers, each driven by 4 strands of  $\frac{1}{16}$  in. strip elastic purchased from Messrs. Warburton and Allen, Leicester. I have had fairly good results with this somewhat low powered model. On more than one occasion it has remained in the air for more than 30 seconds, and covered 300 yards in that time, at an altitude of about 20 or 25 feet. I will be very much interested if Mr. Mann can suggest where there is any waste about this model. Success depends on efficiency, not on high power. Mr. Mann states in his letter that a propeller develops power. This is something new. I was always of the opinion that it transmitted power. As his wish to see a scale model fly half-a-mile, this is hardly a fair challenge, because the twisted elastic flying-stick is not a practical aeroplane, and should not be compared alongside an engined scale model which is practical and more worthy of credit if it is able to fly at all. I am sorry I am not able to boast of having constructed an engined model myself, but am confident that I will some day be able to materialise something better and more practical than twisted elastic.

Glasgow.

BUITRE.

[1397] I have read Mr. Mann's criticism (1,385) of my letter (1,368), and would like to reply to a few of his questions and statements.

Mr. Mann seems to interpret my letter as an attack upon rubber as a motive power for models. I would ask him:—Is stating the limits of rubber making an attack upon it?

Mr. Mann says further, that I describe all elastic-driven machines as "flying sticks," but I think that if he will look again at the heading of my letter, he will see that it is long-distance models I am dealing with; and surely long-distance models, with no chassis, with their planes, which are usually merely a length of wire bent round, with two or three ribs, or a rectangle of wood, may be called "flying sticks," which term he says has hitherto been applied to models intended to win competitions. But is not a long-distance flyer designed to fly a long distance, and are not model designers engaged in an eternal competition to achieve record distances?

The power is, as I said before, the rate of doing work, or the rate of giving out energy, and it is not correct to speak of the power of a skein of elastic when the amount of energy that can be stored up in it is meant. When Mr. Mann talks about the power of the six and twelve-strand elastic motors it is the torque he means, or the force pressing on his finger when he winds them up. Perhaps by taking the figures of his motors I may be able to make it clearer. I may say that I noticed in an old copy of FLIGHT that  $\frac{3}{4}$  lb. of elastic would store upwards of 1,000 ft.-lbs. of energy; thus taking the value at 1,300 ft.-lbs. per lb., we get that the six-strand motor, since it will weigh nearly  $\frac{5}{12}$  oz., can store  $\frac{1,300 \times 5}{16 \times 12}$  ft.-lbs. of energy.

Now, if this motor runs down in, say, 30 secs., it will give out  $\frac{1,300 \times 5}{16 \times 12 \times 30}$  ft.-lbs. of energy every second, or its power is  $\frac{1,300 \times 5}{16 \times 12 \times 30}$  ft.-lbs. per sec. Similarly, if the 12-strand motor runs

down in 30 secs., its power will be  $\frac{1,300 \times 5}{16 \times 6 \times 30}$  ft.-lbs. per second.

Thus, if both the motors run out in the same time, the power of the 12-strand one will be just double the power of the 6-strand one. But, now, suppose the 12-strand one to run down in 60 secs.; then

its power will be  $\frac{1,300 \times 5}{16 \times 6 \times 60}$  ft.-lbs. per sec., which is the same as

$\frac{1,300 \times 5}{16 \times 12 \times 30}$ , or the power of the other. So now the 12-strand motor is only giving the same power as the 6-strand one, and it is quite obvious that the former motor, running down in 2 mins., will only

develop half the power which the latter develops on running out in 30 secs. I hope I have now made it clear that the power of a thick rubber motor is not necessarily greater than that of one containing a smaller number of strands.

Mr. Mann then goes on to talk about propellers developing power; I for one have always understood that it was the motor which developed the power, and the propeller which used it. He has misquoted my sentence, which should read—"If it (the motor) be fitted with a large or coarse pitched propeller it . . . will not always develop so much power as if it were fitted with a smaller or finer pitched high-speed propeller." Perhaps after the previous argument it will be understood that the motor will develop less power since it will run slower, and therefore not give out its energy so quickly. If the propeller is geared down, as Mr. Mann says some propellers on full-size machines are in place of a direct drive, the motor will then be able to run perhaps as quickly as it would with a fine pitched direct-drive propeller, and therefore develop the same power as it would if fitted with the latter propeller; while on a full-size machine the engine speed is kept the same, and a slow speed coarser-pitched propeller is substituted for a fine pitched high-speed propeller, the gain being that a propeller with a pitch a little greater than its diameter is more efficient than one with a pitch only about half its diameter. So that if on a given motor, elastic or petrol, a geared down coarser-pitched propeller be substituted for a fine pitched direct-drive one, the only difference will be the difference in efficiencies of the fine and coarse-pitched propellers; but if on an elastic motor the coarse-pitched propeller is not geared down, the power of the motor will drop.

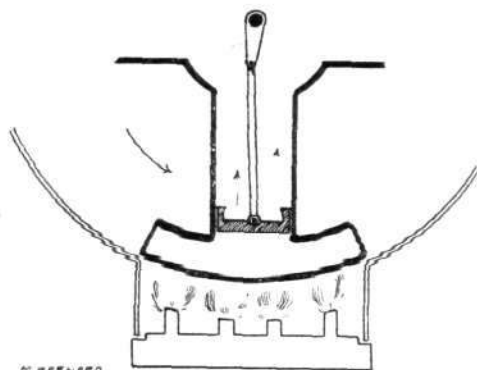
G. T. R. HILL.

## Hot Air Engine.

[1398] Your correspondents, "H. B. M." and "J. G. F." (letter 1332) ask for a criticism of the hot-air rotary engine for model aeroplanes, which they think of making.

Although my experience in model aeroplanes is not extensive, yet I have some experience in the making of model engines of all descriptions.

From the drawing given I should say that they would never get enough speed out of it to drive an aeroplane, as the end of the cylinders would not be given enough time to get hot at anything over 50 or 60 r.p.m. To remedy this I should suggest having larger



ends to the cylinders, in the manner shown in the sketch. This would entail more work and expense, but it would give more time for the cylinder heads to heat, and consequently more speed. If I were "H. B. M." and "J. G. F." I should not enclose the cylinders as they have done. After a time the inside would get so hot that there would not be enough difference in temperature between the cylinder in act of being heated and the others. There is no indication in the drawing of valves, &c. I presume the hot air in the cylinder coming down on the left (referring to drawing) is cooled by contact with outside air. I doubt if this would cool quick enough. I think it would be as well, if possible, to let each cylinder, as it reaches the top, rub lightly against a wick dipped in cold water, or, better still, methylated spirit. I do not wish "H. B. M." and "J. G. F." to think I am making fun of their idea. On the contrary, I think it very ingenious, and would very much like to see their finished model.

Albemarle Street, W.

J. GERALD M. BERNARD.

[1399] The model hot-air engine illustrated diagrammatically in letter No. 1332 by your correspondents "H. B. M." and "J. G. F." could not furnish enough power to drive a 10-in. propeller. It is even doubtful if it could be induced to revolve at all, for the following reasons: 1. The cylinders are only heated directly by the flame when passing the opening in the "shield." Even if the engine were only running at a low speed the time of heating would not exceed a fraction of a second in each revolution. This would have

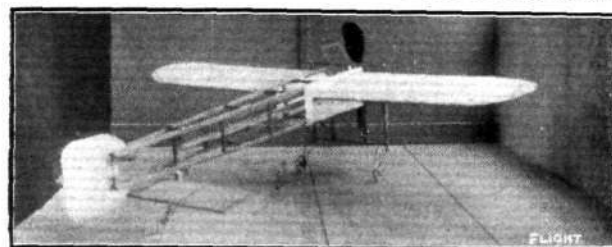
no appreciable effect on the air in the cylinders, and would therefore give rise to no driving power. 2. The cylinders, when revolving at any speed, would probably either blow the lamp out, or so deflect the flame as to make it almost useless. 3. The amount of expansion and contraction of the air, indicated by the stroke of the pistons, would only be attained by working through a large range of temperature. This would necessitate not only heating at one point of the stroke, but cooling at another. There is no provision for this, but, on the contrary, the shield enclosing the cylinders would prevent cooling.

Dublin.

WILLIAM D. DOUGLAS, A.R.C.Sc.I.

## Model Construction.

[1400] I enclose photos of a  $\frac{1}{12}$  scale model Blériot, built from the drawings in FLIGHT. Pine and birch have been used as the timber,



and the planes are covered with silk. The propeller is 9 ins. in diameter, and the weight of the model  $7\frac{1}{2}$  ozs.

Swanley.

H. PLUME.

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22,038. O. G. BOUFFLER. Revolving planes.  
22,323. F. W. GORE. Flying machines.

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97. E. L. MADDEN. Flying machines.

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